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TROPICAL DERMATOLOGY.

ZIEMANN (Hans). Die ubiquitären Hauterkrankungen bei den farbigen Rassen. [**Common Skin Diseases in the Coloured Races.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Vol. 33. No. 3. pp. 68–78 (152–162).

This article really consists only of a tabulation of such affections, which are grouped under various headings, e.g., anomalies of pigmentation, diseases of the sweat and sebaceous glands, of the hair and nails, hypertrophies, atrophies, hyperkeratoses (including lichen planus and psoriasis), neurodermatoses (including pruritus, pemphigus and urticaria), drug eruptions, dermatitis, parasitic diseases (subdivided into fungus and animal), acute infections (including impetigo, sycosis, variola, etc.), chronic infections (including tuberculosis, mycosis fungoides, etc.) and neoplasms. The classification adopted will not receive universal acceptance and there is no mention of syphilis. The whole article is only a reminder that any skin disease may make its appearance in a coloured patient.

M. Sydney Thomson.

KESTEN (Beatrice M.). **Observations on Skin Diseases in Porto Rico.**—*Porto Rico Jl. Public Health & Trop. Med.* 1929. Dec. Vol. 5. No. 2. pp. 185–187. [School of Trop. Med., Univ. of Porto Rico, San Juan.]

An analysis of 560 patients seen between May and August of last year. Fungus infections made up 40 per cent. of the total, pigmentary changes accounted for 22 per cent. and staphylococcal infections amounted to 15 per cent. There were only three cases of acquired syphilis and only one case of true chronic eczema. The common affections of the skin accounted for the remainder of the cases in about equal numbers.

M. S. T.

FOX (Howard). **Dermatology in Brazil.**—*Arch. Dermat. & Syph.* 1929. Nov. Vol. 20. No. 5. pp. 621–628. With 1 text fig.

The author gives a brief review of his experiences in Brazil and succeeds in impressing the reader with the size and importance of that

country and its work. For example, the University of Rio de Janeiro has about 2,500 medical students. Instruction in dermatology is given to sixth-year students for six hours a week during the whole college year of eight months. The new clinic there will contain 150 beds and elaborate laboratories, etc. In Rio, cases of coccidioides infection (blastomycosis), granulomatosis inguinalis, xeroderma pigmentosum, ainhum, etc., were seen. At São Paulo a similar large school is under construction, and here about 70 per cent. of the patients suffer from cutaneous leishmaniasis, many having gross involvement of the naso-pharynx. Mycetoma, "mossy foot," coccidiodal granuloma, pemphigus vegetans and pemphigus foliaceus were also seen. It is estimated that 14 per cent. of the population is infected with syphilis and during the last year in Rio there were 1,500,000 visits paid to the various venereal dispensaries. There is a new hospital with 350 beds and complete research laboratories, built for the treatment of syphilis alone. The prevalence of leprosy in Brazil is shown by the census of last year, with 14,322 cases in the republic. Large hospitals, colonies and asylums for children born of leprous parents are maintained. At the Institute of Hygiene in Rio satisfactory results are being obtained with the complement fixation test for leprosy, using Deycke's antigen (defatted Streptothrix leprae).

M. S. T.

PHOTINOS (Panagiotis). Quelques formes rares de maladies cutanées exotiques. [**Rare Varieties of Tropical Skin Diseases.**]—*Ann. Dermat. et Syph.* 1929. Nov. 6th Ser. Vol. 10. No. 11. pp. 1231–1255. With 29 figs.

An article based on the study of 29 wax models recently presented to the Saint-Louis Hospital by SABOURAUD. Many of them should be classified as "rare" rather than as "tropical" diseases, e.g., those representing xeroderma pigmentosum, mycosis fungoides, porokeratosis, etc. Nine of the specimens portray rare forms of cutaneous leishmaniasis, some closely resembling primary chancres and gummata, one case which can be described as erysipeloid and one patient in whom the nodules were not infiltrated but soft. The remaining six models demonstrate uncommon varieties of leprosy.

M. S. T.

CATANEI (A.). Observations statistiques et parasitologiques sur les teignes chez des indigènes du Sud Constantinois (Algérie). [**Ringworm among the Natives of S. Constantine (Algeria).**]—*Bull. Soc. Path. Exot.* 1929. May 8. Vol. 22. No. 5. pp. 299–302. [1 ref.]

This work was carried out along the same lines as were adopted by the author in S. Oran and Algiers; similar results have been obtained. Of 719 patients examined, 140 (19·4 per cent.) were infected, 56 with Trichophyta, 83 with Favus and 1 with both. On culture, *T. glabrum*, *T. violaceum* and *A. schoenleinii* only were found. Favus is much the most common in El Kantara. The majority of cases were between 5 and 10 years of age.

M. S. T.

SILVA (Flaviano). Tinea nigra (cladosporose epidermica). [**Tinea nigra (Dermal Cladosporosis).**]—*Brasil-Medico.* 1929. Aug. 10. Vol. 43. No. 32. pp. 924–926. With 1 text fig. [20 refs.]

This condition, first described by MANSON in 1872 in South China, was studied by CASTELLANI in Ceylon in 1905 and the parasitic fungus was named *Cladosporium mansoni.*

The first case recorded in Brazil was in Rio de Janeiro in 1921, but the fungus isolated differed somewhat on culture and was denominated *Cladosporium wernecki.* Cure is readily secured by local application of 1 per cent. iodine followed by an ointment of salicyclic acid and yellow oxide of mercury.

H. Harold Scott.

DA VEIGA (Americo). Algumas especies novas de cogumelos causadores de tinhas. [**New Species of Trichophyton.**]—*Brasil-Medico.* 1929. July 20. Vol. 43. No. 29. pp. 830–838. With 4 text figs.

The author describes four species of Trichophyton and compares them in detail with others already known and concludes that they do not conform to any of the latter. He has named them *Trichophyton bicolor* (because of a reddish-yellow and a green colour on growth), *T. flavivirens* (also with a green growth), *T. cineraceum,* and *T. acutulum.* The first was very contagious, the patient infecting three others in the family, and the cultures retained vitality for at least two years, giving exuberant growth on sub-culture.

H. Harold Scott.

HOOLBOOM (L. E.). **Dhobie-Itch and other Epidermophytoses. (A Contribution to the Study of the Epidermophytoses.)**—*Acta Leidensia* (*Scholae Med. Tropicae*). 1928. Vol. 3. pp. 263–293. With 10 plates. [41 refs.]

This article contains very full descriptions of the ordinary cultural forms and of the microcultural (" hanging drop ") appearances of the following epidermophytons : *E. inguinale* ; *E. cruris* ; *E. clypeiforme* ; *E. interdigitale* ; *E. rubrum* ; *E. plurizoniforme* ; *E. lanoroseum* ; *E. niveum.* The illustrations are exceptionally good.

M. S. T.

MCGUIRE (C.). **Colour Variations in the Fungus of Dhobie's Itch** (*Epidermophyton cruris*).—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 2. pp. 438–441. [School of Trop. Med. & Hyg., Calcutta.]

Nine strains of Epidermophyton were cultivated and showed variations in colour, presence or absence of downiness, number of concentric rings, and the character of the radial furrows. Morphological study indicated that the nine strains were all varieties of the one species, *Epidermophyton cruris.*

P. Tate.

MAXWELL (T. A.). **Treatment of Epidermophytosis (Dhobie Itch) with Castellani's Fuchsin Paint.**—*Jl. Trop. Med. & Hyg.* 1929. June 1. Vol. 32. No. 11. p. 148. [1 ref.] [Dermat. Dept., Tulane Univ., New Orleans.]

The author places on record the marked success which has attended the treatment of chronic and resistent cases by this method.

M. S. T.

CARRIÓN (A. L.). **Preliminary Report on the Fungus causing Epidermophytosis of the General Surface of the Skin in Porto Rico.**—*Porto Rico Jl. of Pub. Health & Trop. Med.* 1929. Sept. Vol. 5. No. 1. pp. 40–44. With 2 plates. [3 refs.] [School of Trop. Med., Univ. of Porto Rico, San Juan.]

General epidermophytosis is found in over 6 per cent. of skin patients in Porto Rico. The disease is very contagious, has a marked tendency to generalize, may affect all parts of the skin, including the scalp, and often injures or destroys the nails. The causal fungus resembles *Epidermophyton rubrum*, Castellani, 1910.

P. Tate.

PANJA (Ganapati). **The Malassezia of the Skin, their Cultivation, Morphology and Species.**—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 2. pp. 442–456. With 7 text figs. & 3 plates (1 coloured).

After many unsuccessful attempts with many different media, the author cultivated the three organisms, *Pityrosporon ovalis*, Sab., 1895, from cases of dandruff, seborrhoea, etc.; *Malassezia* (*Microsporon*) *furfur* (Charles Robin, 1853), from cases of pityriasis versicolor; and *Malassezia tropica*, Cast., 1905, from cases of tinea flava.

For primary cultures the best medium is modified Petroff's—meat infusion in 15 per cent. glycerinated water, and the whole contents of an egg, equal parts, with the addition of 0·004 per cent. gentian violet. Growth occurs most readily at the junction of the dry and moist areas of the medium and may be either chalky or pinkish. Sub-cultures grow on all laboratory media, but best on glucose or glycerin agar. Growth is best at 37° C., but takes place at room temperature, and occurs from pH 5 to pH 9, the optimum reaction being pH 5–7·5. The fungi are aerobic and do not ferment any sugars. They resist formalin vapour for two hours, but are killed by sulphur dioxide in half a minute or less.

From its cultural aspect, the author considers that *Pityrosporon ovalis* should be included in the genus *Malassezia*.

P. Tate.

DE RAYMOND. Traitement du Tokelau par la pommade salicylique. [**The Treatment of Tokelau Ringworm by Salicylic Acid Ointment.**]—*Bull. Soc. Méd.-Chirurg. Indochine.* 1929. Apr. Vol. 7. No. 4. pp. 225–226.

A typical and generalized case of Tokelau ringworm was given injections of lugol and iodine as well as local applications of iodine, benzoic acid, chrysophanic acid, sulphur, etc. These only succeeded in increasing irritation. Then an ointment containing 5 per cent. of salicylic acid was rubbed in vigorously each day. In fifteen days the skin was clear and no relapse was observed during the next four months.

M. S. T.

CATANEI (A.). Etude expérimentale de souches algériennes de *Trichophyton violaceum.* [**Experimental Study of** *T. violaceum* **found in "Stumps" from Algeria.**]—*Arch. Inst. Pasteur d'Algérie.* 1928. Dec. Vol. 6. No. 4. pp. 446–452. With 4 figs. on 2 plates. [1 ref.] [Pasteur Inst. of Algeria, Algiers.]

Both infected hairs and cultures of the fungus were inoculated into the scalps and other areas of various animals. The disease was

successfully transmitted to dogs, cats and monkeys. Rabbits, mice, pigeons and most guineapigs failed to contract the infection. The fungus always maintained its "endothrix" character and caused lesions in the dog and monkey which very closely resembled those seen in the human scalp. In the cats and a few guineapigs, however, the lesions were small, discrete and soon disappeared spontaneously.

M. S. T.

CATANEI (A.). Sur le pouvoir pathogène des *Trichophyton violaceum* et *glabrum* pour les animaux. [**Pathogenicity of** *Trichophyton violaceum* **and** *T. glabrum* **for Animals.**]—*C.R. Soc. Biol.* 1929. Apr. 26. Vol. 100. No. 13. pp. 1108–1110. [4 refs.] [Pasteur Inst., Algiers.]

The author has experimentally infected the monkey, dog and cat with cultures of an Algerian strain of *Trichophyton violaceum*, and also succeeded in infecting one out of 15 inoculated guineapigs. In these animals it behaves as an "endothrix," but the proportion of hairs found in the stage of invasion is larger than in man, and this fact led BILRIST to consider it to be an "endo-ectothrix." The experiments with *T. glabrum* were carried out with guineapigs, two of which were inoculated with parasitized hairs, and six with cultures on glucose agar aged 18, 34, and 14 days. After 11 days one of the two guineapigs inoculated with the 14 days old culture was found to be infected. The other was re-inoculated with a culture 25 days old and developed a ringworm patch after 10 days. The experimental lesions lasted about 3 weeks and were finely scaly, with dry white scales, and a certain number of fallen hairs, but the patches were not bare. In the hairs *T. glabrum* behaved as an endothrix and resembled *T. violaceum*.

P. Tate.

TATE (P.). **On the Enzymes of Certain Dermatophytes, or Ringworm Fungi.**—*Parasitology.* 1929. May. Vol. 21. Nos. 1 & 2. pp. 31–54. [28 refs.] [Molteno Inst., Univ., Cambridge.]

A very complete account of the experiments and their results which should certainly be read in full by those interested in this particular aspect of the physiology of fungi. The enzymic activity was studied in the following species: *Sabouraudites radiolatus; S. lanosus; S. audouini; Trichophyton tonsurans; Grubyella schoenleinii.* From the clinical point of view it is interesting to note that the presence of keratinase could never be demonstrated, and that all contain a proteolytic enzyme which is really active only in an alkaline medium.

M. S. T.

LANGERON (Maurice). Le *Trichosporium pedrosoi* (Brumpt, 1921), agent de la dermatite verruqueuse brésilienne. [*Trichosporium pedrosoi*, **the Cause of Brazilian Dermatitis Verrucosa.**]—*Ann. Parasit. Humaine et Comparée.* 1929. Mar. 1. Vol. 7. No. 2. pp. 145–150. With 2 text figs. [7 refs.] [Parasit. Lab., Faculty of Med., Paris.]

The parasite of Brazilian dermatitis verrucosa (chromoblastomycosis) has been isolated and placed in different genera by various authors at different times. Langeron now considers that it is really a *Trichosporium* and gives its synonymy as follows:—*Trichosporium pedrosoi* (Brumpt 1921). Synonyms:—*Hormodendron pedrosoi* (Brumpt 1921); *Acrotheca pedrosoi* (Brumpt 1921), Terra, Torres, da Fonseca et Leao; *Trichosporium pedrosianum* (Ota 1928).

P. Tate.

HORTA (P. de F. Parreiras). L'achromie parasitaire au Brésil (note préliminaire). [**Parasitic Achromia in Brazil.**]—*Rev. Sud-Américaine de Méd. et de Chirurg.* Paris. 1930. Feb. Vol. 1. No. 2. pp. 152–154. With 1 text fig.

Certain cases have recently been seen by the author which would seem to be similar to those described in Madagascar by FONTOYNONT. The dark skin of the native shows white or yellowish scaly discs and microscopy demonstrates abundant mycelial elements. Cultures differ from those obtained in Madagascar. A brief preliminary account which is to be amplified later.

M. S. T.

DE MELLO (Froilano) & RODRIGUES (A.). Sur un cas de blastomycose à placards multiples végétants verruqueux ou pustulo-ulcérés. [**A Case of Blastomycosis.**]—*Bull. Soc. Path. Exot.* 1929. Mar. 13. Vol. 22. No. 3. pp. 142–147. With 2 text figs. [School of Med., Nova Goa, Portuguese India.]

—— & ——. **Preliminary Note on a Case of Dermatomycosis with Multiple Verrucose or Ulcerated Patches.**—*Antiseptic.* 1929. Apr. pp. 427–432. With 8 figs. on 2 plates.

This case, the first of its kind to be recognized in Portuguese India, occurred in a youth of 18 years and gave a continuous history over the previous 8 years. A full clinical description is amplified by illustrations, which are, however, poor. The histology of the lesions and of the parasitic elements are detailed, as are experimental inoculations of rabbits and white mice. The organism is in this case a Monilia. No form of treatment has so far had any influence on the progress of the disease.

M. S. T.

PEÑA CHAVARRIA (A.) & SHIPLEY (Paul G.). Contribución al estudio de los carates de América tropical. [**Contribution to the Study of Pinta in Tropical America.**]—Reprinted from *Rev. Méd. Latino-Americana.* 1925. Mar. Vol. 10. No. 114. 76 pp. With 3 maps, 4 diagrams & 18 figs. on 20 plates. [38 refs.]

This is more than a contribution to the study of the various forms of carate ; it is a survey in some detail of the whole subject. Sections of the essay deal with the history of the disease, which is traced from doubtful references in the early sixteenth century to the present day, the geographical distribution illustrated by maps showing that it exists in Mexico, Central and South America, the islands of the Caribbean, the Guianas and Venezuela. In greater detail the prevalence is given in various districts of Colombia. Next follows a general clinical description, with fuller accounts of the individual varieties—white, black, violet, blue and red—and a discussion of the diagnosis from leprosy, morphoea, pellagra, chloasma and other pigmentary skin disorders. Its aetiology is dealt with under the headings of race, sex, age and occupation. A description of the associated fungus, an Aspergillus, follows, with photographs of cultures on Sabouraud's medium, and microphotographs of sections of the skin showing the growth in, and involvement of the sebaceous glands and deeper layers of the cutis. Two possible insect vectors are mentioned, *Simulium haemotopotum* and *S. ochraceum*, and, finally, treatment is considered.

This consists in the local application of iodine, or, better, an ointment containing calomel 1 gm., salicylic acid 0·05 gm., lanoline 50 gm., and the use of arsenic internally. The whole constitutes a good and full account of this interesting and too little studied condition.

H. Harold Scott.

CIFERRI (R.). Sur un *Acrothecium* isolé du "mal de pinto" mexicain, *Acrothecium nigrum* n. sp. [*Acrothecium nigrum* **n. sp. isolated from Mexican Pinta.**]—*Ann. Parasit. Humaine et Comparée.* 1929. Nov. 1. Vol. 7. No. 6. pp. 524–535. With 3 text figs. [8 refs.] [National Agronomic Station & Agric. College, Moca, Dominican Republic, Haiti.]

A fungus isolated from a case of "black pinta" in Mexico is considered to be a new species of the genus *Acrothecium* Preuss emend. Sacc. nec Corda, and is named *Acrothecium nigrum*. The validity and synonomy of the genus *Acrothecium* is discussed and the author thinks the new species may prove to be near *Montoyella nigra* Castellani, which is also found causing "black pinta."

P. Tate.

DA FONSECA (O.) & LEÃO (A. E. de Arêa). [In Portuguese & English.] Sobre os cogumelos da piedra brazileira. **On the Fungus of Brazilian Piedra.**—*Inst. Oswaldo Cruz. Supplemento das Memorias.* 1928. Dec. No. 4. In Portuguese pp. 124–125. With 4 figs. on 2 plates. In English pp. 126–127. [Oswaldo Cruz Inst. & Med. School, Rio de Janeiro.]

—— & ——. Sur les champignons de la piédra brésilienne. [**The Fungi of Brazilian Piedra.**]—*C.R. Soc. Biol.* 1929. Apr. 8. Vol. 100. No. 11. pp. 935–936. [Oswaldo Cruz Inst., & Dermat. Clinic, Faculty of Med., Rio de Janeiro.]

In 1911 HORTA described in the nodules of Brazilian "piedra" spherical cysts each of which contained a number of fusiform ciliated bodies. The presence of these cysts led BRUMPT to separate the parasite of Brazilian "piedra" under the name *Trichosporum hortai* from the Colombian form known as *Trichosporum giganteum*. The present authors suggest that the Colombian cases have not been sufficiently studied to make sure whether or not the cysts of Horta are present; and further suggest that these cysts are really asci with fusiform ascospores. They have obtained two types of cultures from "piedra," both of which may be isolated from the same case. The first type has black, dry colonies covered with aerial hyphae, and corresponds to the species *T. hortai* of BRUMPT; and the second has white or yellowish, smooth, dry or moist, rough or cerebriform colonies, and resembles cultures of European and Asiatic species of *Trichosporum*. Recently, on aged cultures of the *T. hortai* type on carrot, fusiform, elongated spores were found which are similar to those present in the nodules of Brazilian "piedra." These spores are characteristic of the new genus *Piedraia* which the authors have formed for the parasite of Brazilian "piedra," the type species being *Piedraia hortai* (Brumpt, 1913).

P. Tate.

LANGERON (Maurice). Les asterinées parasites de l'homme. La piedra. [*Asterineae* **parasitizing Man. Piedra.**]—*Ann. Parasit. Humaine et Comparée.* 1929. July 1. Vol. 7. No. 4. pp. 309–324. With 18 text figs. [16 refs.]

The Asterineae are a group of pyrenomycetous fungi parasitic on the surfaces of leaves in very moist climates, especially in the intertropical zones. They form dark-coloured patches on the leaves constituted of a coriaceous stroma in which are developed more or less differentiated perithecia. South American piedra has a distribution parallel to that of the Asterineae, and since the nodules on the hairs in cases of piedra resemble the stromata of the Asterineae in structure, and the "cysts of Horta" are, in the author's opinion, asci containing vermiform ascospores, he concludes that Brazilian and Paraguayan piedra are due to a primitive type of pyrenomycetous fungus near the *Protothyriaceae.* The fungi of S. American piedra are very different from those causing European and Asiatic piedra, which have not the characters of Asterineae and should remain in the genus *Trichosporum* (Behrend, 1890), Vuillemin, 1902; while the S. American forms should be placed in the new genus *Piedraia* proposed by da Fonseca and Leão, 1928. Not sufficient is known about Colombian piedra to allow it to be placed in either group at present.

P. Tate.

DELAMARE (G.) & GATTI (C.). Culture de la "piédra" paraguayenne. [**Culture of Paraguayan "Piedra."**]—*C.R. Soc. Biol.* 1928. Nov. 9. Vol. 99. No. 31. pp. 1425–1427.

Cultures of the Paraguayan variety of *Trichosporum hortai* were obtained from infected hairs which had been kept dry for several weeks. Cultures were obtained on Sabouraud's glucose agar with litmus; and the fungus also grew on maltose, lactose, laevulose, and glycerin agar, and on carrot and potato. Growth was very slow at room temperature and practically nil at 37° C. Cultures are black, shading to grey at the periphery, and the mycelium is formed of hyphae of rectangular cells which measure 6 by 4·5 microns to 9 by 3 microns.

P. Tate.

AARS (Ch. G.). Over het voorkomen van piedra in Suriname. [**On the Occurrence of Piedra in Surinam.**]—*Nederl. Tijdschr. v. Geneesk.* 1929. Aug. 24. 73rd Year. 2nd Half. No. 34. pp. 3903–3910. With 3 text figs. [9 refs.] [Military Hosp., Paramaribo.]

The author's conclusions from his observations are the following:

1. In Surinam a type of piedra occurs, probably identical with piedra Brasiliana.

2. Of 30 samples examined, 26 originated from Creoles (among them 3 women), 3 from Europeans and 1 from a Javanese.

3. The Surinam piedra is not a purely epiphytic affection.

4. Cultures, if taking at all, develop very slowly.

5. The causative agent is most probably an ascomycete, presumably belonging to the genus *Penicillium.*

6. The contagiosity of the piedra fungus is low and the way of transmission is so far unknown. An experimental infection did not succeed.

The author deals with the differential diagnosis from other Trichosporum infections, Trichomycosis nodularis, Pediculosis capitis, Trichorrhexis nodosa and Aplasia moniliformis pilorum. Treatment with spirituous disinfectants (if necessary after cutting the hair) usually leads to a rapid cure.

W. J. Bais.

MONTPELLIER (Jean). Les mycétomes algériens. [**Mycetoma in Algeria.**]—*Rev. Prat. Malad. des Pays Chauds.* 1928. Dec. Year 7. Vol. 8. No. 12. pp. 595–596; 599–602; 605–607. [4 refs.]

The author includes under this heading all fungus infections except ringworm. A review of the literature reveals only 31 cases, including sporotrichosis, blastomycosis, actinomycosis, etc. To this number he adds eight cases of his own and states that any of these infections may belong to one of three clinical types. In the first group are the very early infections which are seen as small, hard nodules in the skin or subcutaneous tissues. The second group contains older lesions which have attained the size of a nut. Finally, there are the long-standing cases in which the infection has spread to involve all the adjacent structures, e.g., Madura foot. Detailed descriptions are given of the histological appearances at each of these stages.

M. S. T.

SILVA (Flaviano). Contribuição para o estudo do mycetoma podal na Bahia. [**Madura Foot in Bahia.**]—*Sciencia Med.* 1929. Apr. Vol. 7. No. 4. pp. 153–162. With 6 figs. on 2 plates. [23 refs.]

The author has collected ten cases of mycetoma of the foot in Bahia; he narrates in detail two of his own cases. The first was very extensive, the thigh and the groin glands being affected; the disease having existed for 14 years, amputation was decided upon; the granules were yellowish-white. The second involved the foot only, the granules were black, and treatment by curetting sufficed to cure. Cultivation proved the organism to belong to the Madurella, but is believed to be a new species. Inoculation into two guineapigs has not succeeded.

H. Harold Scott.

DELANOË (P.). Mycétome de la cuisse observé chez un marocain adulte, du à une microsiphonée, *Nocardia nicollei*, n. sp. [**Mycetoma of the Thigh due to** *Nocardia nicollei* **n. sp.**]—*Arch. Inst. Pasteur de Tunis.* 1928. Sept. Vol. 17. No. 3. pp. 257–274. With 3 figs. [2 refs.] [Mazagan Hosp., Morocco.]

——. Au sujet de l'historique de l'étude des mycétomes observés au Maroc. —*Ibid.* 1929. Mar. Vol. 18. No. 1. pp. 71–72. [6 refs.]

The patient, an adult Arab aged 50, had a mycetoma of 11 years' duration involving the upper two-thirds of the right thigh, but not invading the abdomen. The clinical aspect was that of a typical mycetoma. The pus contained numerous yellowish grains, 0·5–1 mm. in diameter, of very soft

consistency, and formed of an enrolled cord-like mass. Cultures of an Actinomyces were readily obtained on all the usual media. It closely resembles *Nocardia* [*Actinomyces*] *dassonvillei*, from which it differs only in being a facultative anaerobe, and in forming a yellowish pigment on potato. It is regarded as a new species and is named *Nocardia* [*Actinomyces*] *nicollei*. Cultures were not pathogenic for pigeons, rabbits or guineapigs. Intensive treatment with potassium iodide led to improvement, but the patient left hospital and died about six months later.

The second paper corrects some historical statements made in the first.

P. Tate.

PUESTOW (K. L.). **Maduromycosis. A Contribution to the Study of Maduromycosis, with Report of a Case of Infection with** *Aspergillus nidulans*.—*Arch. Dermat. & Syph.* 1929. Nov. Vol. 20. No. 5. pp. 642–664. With 14 text figs. [19 refs.] [State of Wisconsin General Hosp., Madison.]

A long and detailed account is given of the history, etc. of this affection.

There is then described a case occurring in a white girl aged 19, who had never been south of New York until after the onset of the disease. Nose, cheeks, the extensor surface of the right forearm and the skin behind the right ear were affected. After repeated failures to eliminate the disease over a period of six years, cure was ultimately attained by wide excision, including a liberal margin of apparently healthy tissue. The organism was proved to be *Aspergillus nidulans*.

M. S. T.

VASUDEVAN (A.) & SESHADRINATHAN (N.). **A Few Observations on Mycetoma : a Preliminary Communication.**—*Indian Jl. Med. Res.* 1929. July. Vol. 17. No. 1. pp. 170–173.

Fungi [the names of which are not given] from cases of red, black and white mycetoma were cultivated on bamboo-twigs, stems of prickly pear and on soil medium. The authors consider that observation of the mode of growth of fungi from mycetomas on such substances may aid in identifying them if they are met with growing saprophytically in nature.

P. Tate.

DELAMARE (G.) & GATTI (C.). Hyphomycète cultivable à grains blancs réniformes et durs (*Indiella americana*). [**Cultivable Hyphomycete with White, Reniform, Hard Grains.**]—*C. R. Acad. Sci.* 1929. May 6. Vol. 188. No. 19. pp. 1264–1266. With 3 text figs.

Grains from a case of mycetoma of the foot were formed of a sterile hyphomycete which is near *Indiella mansoni*, but is described as a new species and is named *Indiella americana*. The grains measure 0·25 mm. to 0·5 mm., or exceptionally 1 mm., in diameter, and are opaque, milky white, hard and fragile. They are generally reniform, but are sometimes ovoid and rarely multilocular. They are composed of branched, septate mycelium. the segments of which measure 6 to 23 by 0·5 to 4 microns ; ovoid or piriform cells 3 to 8 by 7 to 11 microns ; and a colourless interstitial substance. The growth on various media is described. Inoculation of the foot of a pigeon, according to Pinoy's technique, was negative. Intradermal injection of 3 drops of an antigen, formed of a month-old culture on broth heated to 120°, caused a marked cuti-reaction in the patient ; while similar injection of 8 controls, one of whom had a different type of mycetoma, was negative.

P. Tate.

LANGERON (Maurice). Mycétome a *Torula jeanselmei* Langeron, 1928. Nouveau type de mycétome à grains noirs. [**Mycetoma with Black Grains due to** *Torula jeanselmei*.]—*Ann. Parasit. Humaine et Comparée.* 1928. Oct. 1. Vol. 6. No. 4. pp. 385–403. With 12 figs. [9 refs.] [Parasit. Lab., Faculty of Med., Paris.]

This paper gives a detailed account of the fungus, *Torula jeanselmei*, isolated from a case of black-grained mycetoma [see this *Bulletin*, Vol. 26, p. 106]. The synonomy of the genus *Torula* is discussed in detail, and the priority of *Torula* Persoon, 1796, emend. Saccardo, 1880, over *Torula* Turpin, 1838 sensu Pasteur-Hansen, emend. Will, 1917, is established. The morphology of *Torula jeanselmei* enables the diagnosis of the genus to be made more precise.

P. Tate.

GASTAMINZA (Ubaldo). Un caso de maduromicosis en el Rif. [**A Case of Maduromycosis in the Riff.**]—*Medicina Países Cálidos.* Madrid. 1929. Sept. Vol. 2. No. 5. pp. 445–449. With 2 text figs.

A typical case of Madura foot, due to a Madurella type with black spores.

H. Harold Scott.

ACTON (Hugh W.) & MCGUIRE (C.). **Keratolysis Plantare Sulcatum, a Lesion due to an Actinomycotic Fungus.**—*Indian Med. Gaz.* 1930. Feb. Vol. 65. No. 2. pp. 61–65. With 3 plates (1 coloured). [8 refs.]

The authors believe this condition to be identical with that described by CASTELLANI as keratoma plantare sulcatum, and its differential diagnosis from tylosis, occupational keratodermia, fungal and eczematous keratodermias and keratodermia cribrata (or punctata) is fully discussed. In Bengal the lesions occur on the soles of those who walk barefooted on damp earth during the monsoon months. The lesions start as small pits in the thickened epidermis of the heel and tread of the foot. These gradually deepen, the edges being irregular and dark. Coalescence and furrowing then give rise "to an appearance like the surface of a moderately coarse sponge." In fact, there is no hyperkeratosis or plugging, but a definite lysis of the horny layer. Lesions on the hands are very rare. The fungus, which has been found in each of eight cases, resembles the *Actinomyces bovis* of the American Type Culture Collection. Full cultural details are given and there is described a modification of Ponders' stain whereby fungus can be easily detected even in thick pieces of epidermis. This consists of 1 per cent. of toluidin dissolved in 2 per cent. of glacial acetic acid, 4 cc. of absolute alcohol and 93 cc. of water. The material is then cleared in glycerine and can be examined whilst wet. In hospital cure is easily obtained by painting with 5 per cent. formalin, *i.e.*, whilst the patient's feet can be kept dry. Prevention can be attained by using the same solution once a week during the monsoon months.

M. S. T.

JIMENEZ (Carlos Manuel). **Tropical or Phagedenic Ulcer.**—*Seventeenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1928. pp. 180–183. [United Fruit Co. Hosp., Port Limon, Costa Rica.]

Stress is laid on the presence of fusiform bacilli and spirochaetes. These the author regards as pathogenic, as he refers to

secondary infections with other organisms. In discussing the differential diagnosis he emphasizes the fact that the sites of election are the lower third of the leg and the dorsa of the feet. "It is exceptional to find the true tropical ulcer on other parts of the body," this being due to the fact that the lesions are caused by exposure of a superficial wound to infected damp floors or mud. "The ulcers appear to exist in two types, one of slow evolution (atonic forms) and the other of a malignant type, phagedenic and gangrenous." Treatment consists of a preliminary bath in Dakin's solution, this being followed by local applications of gauze saturated in 4 per cent. neoarsphenamine in glycerine. This is supplemented by injections of the same drug and a general course of tonics.

M. S. T.

BRANCKAERT (J.). L'ulcère phagédénique ou tropical et son traitement. [**Phagedaenic or Tropical Ulcer and its Treatment.**]—*Bruxelles-Méd.* 1929. Aug. 25. Vol 9. No. 43. pp. 1205–1207.

A general account of the condition and its treatment. Whilst recommending neosalvarsan in glycerine as a local application, the author believes that injection of that drug is useless. Heliotherapy and dressings with calcium hypochlorite are recommended. If much mucoid exudate is present 50 per cent. ac. carbolic in glycerine produces good results. Stress is also laid on the importance of dealing with any other affections from which the patient may be suffering, on the necessity of prolonged treatment and on the necessity of observation over a long period after apparent cure.

M. S. T.

PINTO (Genserico de Souza). Considerações acerca da ulcera phagedenica tropical. [**Phagedaenic Tropical Ulcer.**]—*Folha Med.* 1929. Oct. 5. Vol. 10. No. 28. pp. 343–345. With 4 text figs. [5 refs.]

In Bocayuva, State of Minas Geraes, tropical ulcer is very common and causes much incapacity among agricultural labourers. In the early stages the author found a Gram-positive diplococcus so frequently that he believes it to be of aetiological significance, as well as Vincent's treponema and *B. fusiformis*. He finds the best treatment is the local application of powdered neosalvarsan.

H. Harold Scott.

MAASS (Edgar). Zur Behandlung hartnäckiger Ulcera der Zehen. [**Treatment of Resistant Ulcers of the Toes.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. May. Vol. 33. No. 5. p. 303.

A brief note in which it is stated that these lesions are regarded as varieties of ulcus molle tropicum. The author removes the nail under local anaesthesia. Healing is then usually rapid and uncomplicated under constant dressings with 0·2 per cent. lotions of trypoflavine or argoflavine.

M. S. T.

MACIEL (Heraldo). Sobre o tratamento da ulcera phagedenica tropical. [**The Treatment of Phagedaenic Tropical Ulcer.**]—*Sciencia Med.* 1929. Sept. Vol. 7. No. 9. pp. 471–474.

Two cases are recorded in which success followed the use of neosalvarsan injections and the local application of 0·09 per cent. "914." In the second patient, a child of 11 years, a second course of injections was needed, and the local use was stopped as the injections alone appeared to give better results.

H. Harold Scott.

BISWAS (Satya Kinkar). **A Simple Treatment for Naga Sores.**—*Indian Med. Gaz.* 1930. Feb. Vol. 65. No. 2. pp. 88–89. With 1 text fig.

After thorough cleansing of the leg with soap and water, the ulcer is painted with pure carbolic acid. The surrounding areas are protected with vaseline and any excess of acid is removed with cotton-wool. Thereafter the ulcer is dressed daily with sterile vaseline. "In almost all cases the cure is effected in a week or so, but, should the slough re-appear, a second application by the same procedure is sure to bring about a cure."

M. S. T.

WEST (C. O.) & CURTH (W.). Die amerikanische Form der Creeping-Disease. [**The American Form of Creeping Disease.**]—*Dermat. Woch.* 1929. Feb. 16. Vol. 88. No. 7. pp. 229–232. With 4 text figs. [8 refs.] [Rudolf Virchow Hosp., Berlin.]

The form of creeping disease described as American appears to be of frequent occurrence in some of the southern States of the U.S.A., and is here defined (with illustrative figures) as an extensive network of sinuous linear skin-eruptions due to the meanderings of larvae of *Ancylostoma brasiliense* (=*caninum*) between the corium and the stratum granulosum. The movements of the larvae cause intolerable itching and are said to murder sleep at night. Many hundreds of these creeping lines have been observed in one patient. They progress at the rate of about 1 cm. in 24 hours, but may go twice as fast. The tracks frequently become bloody, or vesiculous and pustulous. The wanderings of the larvae may cease in 2 or 3 weeks, or may continue for 3 months; and finally their tracks heal spontaneously, with encapsulation of the individual larvae. 50 per cent. of the cases of this form of creeping disease become infested on the seashore when bathing in places polluted with the faeces of dogs and cats. The lines of treatment mentioned are freezing the infested skin with carbonic acid snow or with ether spray; painting it with collodion, or with tincture of iodine—alternately with use of mercurial ointment or ultra-violet rays; compresses of 1 per cent. solution of picric acid.

A. Alcock.

GIGLIOLI (George). **Creeping Eruption: Case Report from British Guiana.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Mar. 9. Vol. 22. No. 5. pp. 443–445. With 1 plate. [5 refs.]

The eruption in this case was on the buttock, and began with a mild papular erythema, which lasted for four days, and was followed by the formation of inflammatory nodules, and by very distressing itching

exacerbated at night—a condition that continued for seventeen days. The meandering, which was entirely cutaneous, between the corneal and Malpighian layers, then began (and is well shown in a photographic reproduction) and went on for about four weeks. Symptoms gradually subsided with the resorbtion of the products of eruption. The parasite seems not to have been identified, but the infection was contracted in the jungle where the patient had been sitting for some time on damp ground.

A. Alcock.

GRUND (Jacob L.). **Creeping Eruption (Larva migrans). Report of Case.**—*New England Jl. of Med.* formerly *Boston Med. & Surg. Jl.* 1929. Sept. 19. Vol. 201. No. 12. pp. 579–582. With 5 text figs. [23 refs.]

Report of a case of creeping eruption, thought to have originated on a Florida beach and to be due to a nematode worm, cured by two applications of carbon dioxide snow. The history of the subject is reviewed and a bibliography is added; but these things have lately been noticed in this *Bulletin* (Vol. 23, p. 407, and Vol. 24, p. 449).

A. Alcock.

BACKHOUSE (T. C.). **Sarcoptic Skin Disease in Natives of the Territory of New Guinea.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Aug. 26. Vol. 23. No. 2. pp. 173–178. With 9 figs. on 2 plates. [8 refs.]

A full clinical and histological description of the disease known locally as "kas-kas." The author has succeeded in demonstrating the presence of a parasite in 149 out of 424 cases and this in circumstances which permitted but a brief examination of each patient. This parasite seems to be identical with *Sarcoptes scabiei*. It burrows in the horny layer and gives rise to "runs," which are difficult to see in a black skin, but which are most easily detected on the fine skin of the penis. The distribution of the eruption is that usual to scabies, but some cases show such marked crusting and scaling as to suggest "Norwegian scabies." This change commonly occurs in emaciated patients suffering from chronic dysentery, etc. The author succeeded in transferring the disease experimentally to himself. Attention is drawn to the similarity between this affection and the "craw-craw" of Sierra Leone.

M. S. T.

PAMPANA (Emilio J.). Sul "Mossy Foot." Descrizione dei primi casi Colombiani. [**The First Cases of Mossy Foot described in Colombia.**]—*Arch. Ital. Sci. Med. Colon.* 1929. Oct. 1. Vol. 10. No. 10. pp. 465–478. With 3 text figs. English summary p. 479.

The author gives an account of two cases, with photographs, showing the condition of mossy foot. He treated the first with neosalvarsan, alternately with bismuth (Muthanol), and later with potassium iodide. Locally he applied acroflavine, 0·1 per cent., alternately with 0·2 per cent. potassium permanganate. A second photograph showing the condition after three months demonstrates well the improvement. He discusses the diagnosis, dividing cases into two main types: one with confluent papillomatous masses, cauliflower-like, ulcerating early, and producing a discharge and thick crust like a large yaws nodule, the other verrucose, but not confluent, not readily ulcerating, but

resembling elephantiasis. He then considers the distinctive points of blastomycosis, cutaneous leishmaniasis, syphilis, tuberculoma, etc., and maintains that " mossy foot " should not be regarded as a specific entity without further investigation, the name being restricted at present to cases of undetermined aetiology.

H. Harold Scott.

SALISBURY (E. I.). **Mossy Foot—a Case Report.**—*Seventeenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1928. p. 185–190. With 7 figs. [1 ref.] [United Fruit Co. Hosp., Limon, Costa Rica.]

A Jamaican aged 68 presented a " horny-like spur " just above the heel of the right foot which had been present for six years. The mass had a diameter of 2·5 cm. and a height of 2 cm. It was composed of a friable keratoid material and had a moist ulcerating crater. This was excised under local anaesthesia. The accompanying microphotographs are excellent. The presence of *Phialophora verrucosa* was determined by the microscope only. It was not cultivated.

M. S. T.

MACARTHUR (W. P.). **A Case of Epidermolysis Bullosa complicating Malaria.**—*Jl. Roy. Army Med. Corps.* 1929. July. Vol. 53. No. 1. pp. 47–50. With 2 figs.

Typical epidermolysis bullosa in a man aged 40, which had first started three years before and had got rapidly worse with the onset of severe malaria. There was no family history other than that of a brother who developed similar trouble during severe malaria. The patient was given a well-balanced diet and Promonta. Three day courses of calcium lactate (gr. 30 *per diem*) and parathyroid (gr. $\frac{1}{3}$ *per diem*) were alternated with three days free from treatment. Massage with olive oil was carried out locally. There has apparently been complete recovery.

M. S. T.

LUJAN (M.) & NAUCK (E.). Ein Fall von Epidermolysis bullosa aus Costa Rica. [**A Case of Epidermolysis Bullosa in Costa Rica.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Dec. Vol. 33. No. 12. pp. 654–656. With 2 text figs. [2 refs.] [San Juan de Dios Hosp., San José, Costa Rica.]

The first case reported from Costa Rica. A detailed description of a typical example in a girl aged 1½ years. An elder sister was similarly affected and it is interesting that the plucking of coffee berries caused vesicles to appear on the mother's hands. It is suggested that these lesions in the mother represent a mild form of the same disease and that they were not due to any susceptibility to the beans.

M. S. T.

MICHAEL (Jeffrey C.) & SEALE (Everett R.). **Dermatosis papulosa nigra.**—*Arch. Dermat. & Syph.* 1929. Nov. Vol. 20. No. 5. pp. 629–639. With 6 text figs. [4 refs.]

Although the disease occurs essentially among negroes, one case has been seen in a Mexican. " The disorder may appear in childhood as early as the seventh year," but puberty sees an increase in the size and number of the lesions. The incidence of the dermatosis is between 6 and 12 per cent. There are several excellent microphotographs, the chief histological changes found being acanthosis, hyperpigmentation of the epidermis and cutis and rudimentary pilosebaceous elements. It is for these reasons that it is suggested that the condition is naevoid in origin.

M. S. T.

TEDESCHI (Carlo). Le dermatosi infantili e la dermatite estiva epidemica papulo pustulosa (Uarsc) dell' oasi di Derna. [**Infantile Dermatosis and the Epidemic Papulo-Pustular Summer Eruption (Uarsc) of the Derna Oasis.**] *Clinica Pediatrica.* 1929. Aug. Vol. 11. No. 8. pp. 721-736. With 5 figs. [Colonial Hosp., Derna, Cyrenaica.]

Among the children in the Derna Oasis in addition to the ordinary skin diseases there are special forms of a subtropical nature including an epidemic papulo-pustular eruption called "uarsc" by the natives, which Tedeschi has not met with except in Derna. It appears, however, to be prevalent along the coast as far as Tripoli, and is probably transmitted by a tick, *Argas persicus* or *Dermanyssus gallinae.*

J. D. Rolleston.

BOURGUIGNON (G. C.). Notes sur une dermatose nodulaire polymorphe ulcéreuse de l'Ubangi (Zerekoyo, Pupurru, etc. . .). [**A Polymorphic, Nodular and Ulcerative Dermatitis in Ubangi.**] *Bull. Méd. du Katanga.* 1929. Vol. 6. No. 1. pp. 13-23. [6 refs.]

Circumstances compelled the differential diagnosis between this affection and leprosy, syphilis and yaws, to rest on clinical methods only. The months of greatest incidence are March and April. The various native names all signify "fish," and it is believed that if an infected patient eats fish the condition rapidly becomes worse, but it is noteworthy that the natives themselves use different adjectives to describe each stage of the disease. The *first or prodromal stage* may last one year. Muscular pains and headaches are succeeded by bone pains and general lassitude. The *second stage* is ushered in by the appearance of a node over some bony prominence, *e.g.*, clavicle or wrist. Of the size of a pigeon's egg, hard and subcutaneous, it is apparently attached to the periosteum, but is freely moveable under the skin which itself shows no changes. Palpation causes marked pain and puncture yields a "cold," white or yellowish pus. This period may last "two months or more." In the *third stage* the primary tumour breaks down to leave an ulcer with a yellow base, on which are numerous small red granulations. The edge is irregular and the slightest touch causes great pain and haemorrhage which may be copious. The adjacent skin is inflamed, with local lymphangitis and swelling of the neighbouring glands. At this stage one or more nodes appear elsewhere on the body, even at a considerable distance. Lasts some months. The *fourth stage* is a period of generalization, the hands and feet being particularly affected, for in these areas the nodules, ulcers and lymphangitis may be confluent. Spontaneous cicatrization occurs in each area, but fresh lesions are constantly appearing. Gradually cachexia of extreme degree results and death occurs from a terminal infection. Pregnancy often precipitates the appearance of this last stage. During this time too the eyes and nose may be destroyed whilst the ulceration is frequently so severe in the mouth as to lay bare the subjacent bone. The proportion of female to male cases is as two to one. Soamine is useful in healing the ulcers, but iodine and mercury appear to be more efficient in preventing the appearance of secondary nodules. Two cases are described in detail and the article is accompanied by a table demonstrating the differences between this affection and yaws, syphilis and leprosy.

M. S. T.

GOECKERMAN (W. H.), OSTERBERG (A. E.) & SHEARD (C.). **Eczema Solare in a Case of Hematoporphyrinuria.** *Arch. Dermat. & Syph.* 1929. Oct. Vol. 20. No. 4. pp. 501–505. With 1 text fig. [1 ref.] [Mayo Clinic & Mayo Foundation, Rochester, Minn.]

A case of true eczema solare is reported. The accompanying haematoporphyrinuria varied from day to day and rose considerably after exposure of the whole body to the light of a mercury-quartz lamp. Localized exposures produced no such change and it was possible, experimentally, to cause the appearance of the dermatitis on the forearms only. Even then, healthy tissue intervened between the affected areas. The authors consider this condition to represent one of the mildest types of a process which may show such severe changes as are seen in hydroa vacciniforme. In all affections in which light seems to play a part the underlying cause may not lie in the general metabolism but in the metabolism of the epithelial cells themselves, i.e., they contain a substance which absorbs actinic rays with avidity; this renders the cells photosensitive and is responsible for the increased output of haematoporphyrin.

M. S. T.

MATHIS (C.) & BAURY (A.). Pyodermite rebelle de la barbe rapidement guérie par l'antivirus de Besredka. **A Resistant Pustular Dermatitis of the Beard cured by the Use of Besredka's Antivirus.** [*Bull. Soc. Path. Exot.* 1929. Oct. 9. Vol. 22. No. 8. pp. 731–732. [Pasteur Inst., Dakar.]

The case was one of a chronic pustular folliculitis of the beard and moustache which had resisted many local treatments. At last staphylococci from the lesions were grown in Besredka's broth. After exhaustion and filtration of the culture, the filtrate or antivirus was applied locally. Cure was complete after six such dressings (? daily).

M. S. T.

IMSCHENETZKY (A.). Laporteadermatitis. Experimentelle Untersuchungen. [**Dermatitis due to** *Laportea moroides.*] *Dermat. Woch.* 1929. July 27. Vol. 89. No. 30. pp. 1087–1094. With 3 text figs. [7 refs.] [State Inst. for Med. Science, Leningrad.]

An account of the botanical structure of the plant is followed by details of the various experiments made. It is concluded that the urticarial reaction is produced only by the large "hairs" of the leaves and "then only if they are introduced into pilo-sebaceous follicles or if the surface of the skin is broken." Crystals of sodium oxalate were observed in these structures. The histological picture shows simple vaso-dilatation, oedema of the cutis or a slight round celled, perivascular infiltration. [Laportea is an Urticaceous genus wide spread in the tropics, with stinging hairs.]

M. S. T.

BONNE (C.) & LODDER (J.). Ueber eine eigentümliche, dem Lymphogranulom und der Mycosis fungoides verwandte Allgemeinerkrankung. [**A Peculiar Systemic Disease related to Lymphogranuloma and Mycosis fungoides.**] Reprinted from *Beiträge z. Path. Anat. u. Allgemeinen Path.* 1929. Vol. 83. pp. 521–540. With 12 text figs. [23 refs.] [Med. High School, Batavia, Java.]

A very full account of the case in a male native aged 42 years. During life there was obvious only a destructive, ulcerating tumour of the nose and palate, no signs of systemic infection being detected. It was rapidly fatal,

as the patient died within five months of the onset. A post-mortem discovered lesions of a similar histological and ulcerative nature in the pleura, stomach, duodenum, intestines and adrenals. Injection of material into monkeys and guineapigs gave rise to tuberculosis, but the authors do not regard this evidence as sufficient proof of the cause. The histological pictures would suggest a primary hyperplasia of the vascular endothelium of the skin and mucous membranes with subsequent formation of sarcoma-like nodules and ulceration. The staining reactions of the various cells are compared with the corresponding features found in lymphogranuloma and mycosis fungoides, no definite conclusion being reached.

M. S. T.

CASTELLANI (Aldo) & DUVAL (Charles W.). Dermatosis Papulosa Nigra.—*Jl. Trop. Med. & Hyg.* 1929. June 1. Vol. 32. No. 11. pp. 148–150. With 2 text figs. [2 refs.]

CATANEI (A.). Les teignes dans le Sud oranais : considérations générales, formes cliniques et parasitologie.—*Arch. Inst. Pasteur d'Algérie.* 1928. Dec. Vol. 6. No. 4. pp. 435–445. [3 refs.] [Pasteur Inst. of Algeria, Algiers.]

KHANDEHAR (K. G.). Naga Sores in Gwalior.—*Indian Med. Gaz.* 1929. Dec. Vol. 64. No. 12. p. 696. With 2 text figs.

TROPICAL MYCOLOGY.

TALICE (Rodolfo V.). Le concept actuel des mycoses médicales de l'appareil respiratoire. [**Mycotic Infections of the Respiratory Tract.**]—*Rev. Sud-Américaine de Méd. et de Chirurg.* Paris. 1930. Feb. Vol. 1. No. 2. pp. 181–188. [13 refs.]

This paper is concerned with the pathological aspects of the subject only and does not describe cases, organisms, etc., in detail. The author concludes that the majority of fungi isolated are purely saprophytic and have obtained a footing in the mucous membranes after these have suffered lowered resistance as a result of microbic infection. Occasionally they may become definitely pathogenic, however, and when their presence is proved this point of view must always be borne in mind as well as the possibility that their presence aggravates the underlying condition.

M. Sydney Thomson.

BALOG (Paul) & GROSSI (Gino). Allergie der Haut bei Lungenmoniliasis. [**Skin Allergy in Pulmonary Moniliasis.**]—*Arch. f. Dermat. u. Syph.* 1929. May 20. Vol. 157. No. 3. pp. 549–554. [27 refs.]

The allergic reactions in 18 cases of pulmonary moniliasis were investigated by scarification and intracutaneous and subcutaneous inoculation. The antigen consisted of an emulsion of pure culture of the monilia (*Monilia pinoyi*) in physiological salt solution.

At first the fungus was killed by heating to 65° for one hour, but this antigen gave rise to severe general symptoms. When emulsions of the living fungus were used no untoward symptoms supervened. Scarification gave negative results. Intracutaneous injection of 0·1 cc. of the antigen gave positive results in all cases, consisting of a specific reaction beginning after 24 hours. Controls of 18 healthy subjects and 35 cases of pulmonary tuberculosis and other diseases failed to give this late reaction to the antigen. Subcutaneous injection of 0·1 cc. of the antigen resulted in subcutaneous infiltration after 24 hours, which reached the size of a hazel nut in 2 to 3 days, and generally disappeared in from 6 to 7 days. Generalized symptoms, headache, nausea, fever and pains in the limbs, followed injection, but ceased the next day.

Repeated doses of the antigen led to decreased reaction, even when the doses were gradually increased, until ultimately there was no inflammatory reaction, or only such as might follow the injection of any non-specific substance. Parallel with the decreased local reaction, the objective symptoms slowly abated, the cough decreased and the fungus disappeared from the sputum.

In nearly all cases an increase of from 7–8 per cent. in the eosinophile count was observed; and also an increase of from 7–13 per cent. in the monocytes. The degree of these changes did not give any indication as to the severity of the disease.

P. Tate.

GROSSI (Gino) & BALOG (Paul). **Clinical and Experimental Studies on Castellani's Pulmonary Moniliasis.**—*Jl. Trop. Med. & Hyg.* 1929. Sept. 16. Vol. 32. No. 18. pp. 253–262. With 3 text figs. [48 refs.]

The experiments were carried out with *Monilia pinoyi* Cast.; and in all cases an emulsion of one loop of pure culture in 3 cc. of physiological salt solution was used for the inoculation. White rats were inoculated, each with 0·5 cc. of the emulsion, 6 subcutaneously, 3 intraperitoneally, and 6 intrapulmonarily. Subcutaneous and intraperitoneal inoculation gave only a slight local reaction, if any; but intrapulmonary inoculation caused death in 10–14 days. The lungs of the latter animals were the only organs affected and showed advanced hyperaemia of the arteries and contained numerous small, tuberculiform, yellowish nodules. In the nodules [the development and histology of which is described in detail] the fungus was abundant and was also present in the general tissue of the lungs.

Subcutaneous and intradermal inoculation of guineapigs resulted in only a transitory infiltration. Intracardial injection of 1 cc. of the emulsion into 4 guineapigs was fatal in 20–24 days, and blood taken aseptically from the heart after death gave cultures of the monilia. Death was due to acute septicaemia resulting in inflammatory oedema of the lungs and diffuse necrosis of the spleen, the fungus being present in both organs.

An account of the work on the allergy reactions of the monilia in man previously published by the authors [see this *Bulletin* above] follows, together with a detailed description of one case of moniliasis.

Exposure of cultures of the monilia to ultra-violet rays for 1 and 5 minutes was without effect, but exposure for 15 and 30 minutes resulted in temporary microscopical and macroscopical changes. The monilia is killed by the action of 65 per cent. alcohol for 2 minutes, corrosive sublimate 1 to 1,000 for 5 minutes, and 4 per cent. formaldehyde for 5 minutes, but permanganate of potash 1 to 1,000 for half an hour has no effect.

P. T.

KUROTCHKIN (T. J.) & CHU (C. K.). **Bronchomoniliasis: Serological Studies on a Case.**—*Nat. Med. Jl. China.* 1929. Aug. Vol. 15. No. 4. pp. 403–409. With 4 figs. on 2 plates. [3 refs.] [Peking Union Med. College, Peping, China.]

A fungus, provisionally classified as *Monilia tropicalis*, was cultivated from the sputum of what appears to have been a case of fatal bronchomoniliasis. The cultures, when inoculated intraperitoneally or intravenously into rabbits, guineapigs and hamsters, caused death from mycotic septicaemia in 24–48 hours. With the patient's serum positive complement fixation reactions were obtained with an antigen consisting of an alkaline extract of washed monilia cells, and, more strongly, with antigen consisting of the soluble specific substance obtained by 3 precipitations of the alkaline extract with 95 per cent. alcohol. Specific precipitin reactions of low sensitivity were given by adding the alkaline extract and alcohol precipitate to the patient's serum.

P. T.

URBAIN (Achille). Sur la durée de vitalité et de virulence de *Trichophyton gypseum* incorporé à des litières. [**Growth and Virulence of** *Trichophyton gypseum* **on Litter.**]—*C.R. Soc. Biol.* 1928. Vol. 99. No. 38. pp. 1917–1919. [1 ref.]

The litter in two guineapig cages was sprayed with an emulsion of cultures of *Trichophyton gypseum* and then set aside for long intervals. Five months later virulent cultures of *T. gypseum* were recovered from one cage, and guineapigs with scarified backs became infected with typical ringworm when placed in it. Similar results were obtained with the second cage after an interval of nine months.

P. T.

REISS (F.). Caractères morphologiques et biologiques de certaines espèces de *Monilia*. [**Morphological and Biological Characters of Certain Species of Monilia.**]—*Ann. Parasit. Humaine et Comparée.* 1929. Nov. 1. Vol. 7. No. 6. pp. 506–510. With 6 figs. on 1 plate. [4 refs.]

Old strains of *Monilia krusei*, *M. tropicalis*, *M. macedoniensis*, *M. pinoyi*, *M. pseudotropicalis*, and *M. metalondinensis* were investigated. It was found that in their biological reactions every species, except *M. pseudotropicalis*, gave results differing from those observed by CASTELLANI in the production of acid or gas in certain carbohydrates or in the action on litmus milk. Nevertheless, the author concludes that these are minor and unimportant variations, and that the biological reactions afford an excellent means of differentiating different species of Monilia.

P. T.

DE ALMEIDA (Floriano Paulo). Incidencia da blastomycose no Brasil. [**Incidence of Blastomycosis in Brazil.**]—*Bol. Biol.* S. Paulo. 1929. June 30. No. 15. pp. 23–27. [Microbiol. Lab., Faculty of Med., S. Paulo.]

The author has met with 202 cases of blastomycosis in the different States. Statistics are given of the nationalities of 188 of these, and of the ages of 177. Looking up the figures, he found that the numbers of cases occurring in S. Paulo were high, but in the remaining States much lower, and many cases doubtless go unrecorded. The value of statistics based on so small a number is therefore slight.

H. Harold Scott.

MAZZA (Salvador) & PARODI (Silvio). Micosis chaqueña producida por el *Pseudococcidioides Mazzai* (Da Fonseca 1928). [**Mycosis due to** *Pseudococcidioides Mazzai*.]—*Prensa Méd. Argentina.* 1929. July 20. 14 pp. With 4 figs. [Inst. of Clin. Surg., Univ., Buenos Aires.]

A fragment of a small growth found post-mortem in an Argentine was sent to the authors' laboratory. The patient had suffered from a prelaryngeal abscess which was operated upon, but a fistula remained. In sections of the tissue, bodies resembling the Coccidioides recorded by POSADAS in 1892 were found. They differed, however, in size and in the shape of the spores and have been named *Pseudococcidioides mazzai*, and placed in "the Family Protomycetaceae, intermediate between Phycomycetae and Ascomycetae." Photomicrophotographs showing the parasite well are reproduced.

H. Harold Scott.

ABRIKOSSOFF (A.). Ueber "Splenomykosen" und "Mykotische Splenomegalien." [**On Mycotic Splenomegaly.**]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1929. Vol. 272. pp. 593–612. With 16 text figs. [41 refs.]

From a general review of the recent literature on the controversial subject of mycotic splenomegaly, and from his personal investigation of a number of cases, the author comes to the following conclusions. The various mycelial-like structures incrusted with iron salts found in nodules [Gandy-Gamna] in spleens in certain pathological conditions are in no way connected with fungi. The nodules arise from haemorrhages followed by impregnation and incrustation of degenerated tissue elements with iron salts. In cases where cultures of aspergilli were obtained from spleens, the fungus was present as a secondary infection and was not concerned in the formation of the nodules or in the development of the bodies incrusted with iron. The mycotic origin of splenomegaly is not proved, and, in view of the present knowledge on the subject, it is improbable.

P. T.

FASIANI (G. M.) & OSELLADORE (G.). Essai de reproduction expérimentale des nodules de Gandy-Gamna. [**Attempt to reproduce Gandy-Gamna Nodules experimentally.**]—*Presse Méd.* 1929. Aug. 31. Vol. 37. No. 70. p. 1136. [Surg. Clinic, Univ., Padua.]

A case is described in which two small aberrant spleens were removed from above the left testicle of a boy aged 19. Each of them showed siderotic areas with all the characters of Gandy-Gamna nodules. The normal spleen of the patient was quite healthy. The authors consider that this is proof that Gandy-Gamna nodules may be found in spleen tissue which has no tendency to hypertrophy, and may even be undergoing sclerosis, and they consequently support the view that the nodules are due to degenerative changes in the spleen tissue.

They attempted to produce experimental necrosis of the spleen in cats. Positive results were obtained in two cases out of 50, in animals which had received intrasplenic injections of alcohol together with ligature of the vein of the hilus. In each case, around the point of injection of the alcohol, siderotic areas were present and exhibited all the characters of Gandy-Gamna nodules, including, in some cases, rows of refringent rods which resembled fragmented hyphae.

P. T.

SUR (Tarak Nath). **Actinomycosis Hominis.**—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 2. pp. 490–495. [1 ref.]

Since 1918 the author has seen 9 cases of human actinomycosis in India. Two of the cases involved the lung, pleura and chest wall; one case the female breast; two cases the right foot; one case the right hand; one case the right cheek and parotid region; one case the left cervical and sub-maxillary glands; and one case the deep muscles of the back. In early stages, before grains are formed, diagnostic characters of actinomycosis are, shooting pains in an inflamed area, with nocturnal aggravation; absence of ordinary pyogenic bacteria; presence of bacillary forms of actinomyces in monophages of the pus when examined in wet films; and the cultivation of actinomyces on agar medium 5–6 days after inoculation.

P. T.

LINCOLN (Mary C.) & GARDNER (Stella M.). **A Case of** *Rhinosporidium seeberi* **in a Resident of the United States.**—*Arch. Pathology.* 1929. July. Vol. 8. No. 1. pp. 38–45. With 7 figs. [5 refs.]

The second case of *Rhinosporidium seeberi* in the United States is reported. It occurred in a nasal tumour of a man who had never been outside the United States.

P. T.

UNDULANT FEVERS.

SMITH (Theobald). **Undulant Fever: its Relation to New Problems in Bacteriology and Public Health.**—*Medicine.* Baltimore. 1929. May. Vol. 8. No. 2. pp. 193–209. [10 refs.]

This was the De Lamar lecture delivered before the Johns Hopkins University School of Hygiene by the well-known authority who is now Director of the Department of Animal Pathology in the Rockefeller Institute, New Jersey.

The author's standpoint is that of one who is endeavouring to find out from existing data whether or not the bovine type of *Br. abortus* produces undulant fever in man primarily, and not as a secondary invader or graft on some pre-existing pathological state. A brief description is given of the three major races of the Brucella group: those of the cow, the pig, and the goat. In the bovine disease the infectious agent is restricted primarily to the pregnant uterus, more particularly to the epithelium of the chorion, and secondarily to the udder ducts. It is pointed out that the foetus suffers not from an actual disease caused by *Br. abortus*, but from a gradual interference with the circulation in contact with the maternal vessels. In the cow's udder the bacteria are probably retained in the residual milk, where they multiply. Calves fed on this milk fail to become infected.

The author then describes the condition to be found in guineapigs following on inoculation with *Br. abortus* (bovine) and points out that by this procedure it is possible to obtain pure cultures of *abortus* when material containing a mixed growth is inoculated. No invasion of the epithelial cells, similar to that in the bovine chorionic membrane, had ever been noted in guineapigs. The suggestion is made that the placental strain is less pathogenic for man than the strains derived from the milk.

With regard to the porcine strains of *Br. abortus*, these are quite definitely more virulent for the guineapig than the bovine variety, in that the lesions are more conspicuous and are subject to softening and abscess formation, and are rather widely distributed in the lymph nodes as well as in the spleen, testicles and limbs. This strain also multiplies readily in unsealed agar tubes. In the author's view the porcine strain is a more recent adaptation to a new host than are the bovine and caprine.

As regards the caprine race, the author is aware of little research concerning its behaviour in the guineapig or of its relation to disease or abortion in goats.

He then considers other factors which may serve to distinguish between the races of *abortus* on morphological, cultural, physiological, pathogenic and serological grounds. The most impressive physiological distinction among the animal races is the relation to CO_2, freshly isolated bovine strains requiring CO_2, or a sealed tube for primary growth, whereas the porcine and caprine require neither.

Dealing with the subject of undulant fever in man, he remarks on the number of cases in America and elsewhere which have come to light in recent years having no connexion whatever with goats or their milk. Twenty-three strains of human origin have been studied

by the author ; 18 from cases in the United States, the remainder from other countries.

There were no CO_2 inhibitions in any of the American cultures when they were received, and the pathogenic activities in guineapigs showed much variation. These could be grouped, roughly, as follows:—

(*a*) No effect whatever ; no bacteria recovered from spleen. Three strains.

(*b*) The usual more or less variable enlargement of the spleen ; slight enlargement of lymph nodes ; atrophy of testicles. One strain.

(*c*) The usual lesions accompanied by small necrotic foci in the spleen and lymph nodes. Four strains.

(*d*) The usual lesions accompanied by relatively large, or numerous small, necrotic suppurative foci. Ten strains.

As regards class (*a*), the author remarks that in all his experience of bovine strains he has never failed to infect guineapigs and to recover the organism from the spleen.

Groups (*c*) and (*d*) he regards as not bovine, or as bovine modified by passage through swine. The lesions were markedly different from those due to inoculation with bovine strains. Of the many hundreds of guineapigs inoculated in the Department with strains directly derived from cows or with bovine material (macerated chorion, milk, etc.), not one has died.

The author also points out that confusion may arise from the fact that cows inoculated as a preventive with living *Br. abortus* may, and do, pass this modified strain in the milk.

The results of the labours of bacteriologists up to the present may be stated as follows :—

1. Bovine strains or strains not distinguishable from them have been cultured from human patients in a small percentage only of the cases studied.

2. Caprine strains isolated directly from goats' milk need more detailed study.

3. The cultures isolated from man and presumably ingested in cows' milk, but not fitting the bovine type, may have been swine strains introduced into the cow's udder, as are haemolytic streptococci on occasions.

4. The swine type may have been developed in mid-Western States in recent years, due to the enormous development of the swine industry and owing to close association with cows and to the feeding of swine on by-products of the dairy.

On epidemiological grounds it is interesting to note that since so long ago as 1893 the bovine disease has been widespread in the United States, and yet it is only of recent years that cases in man have been reported. An obvious explanation for this would be that the bovine type as excreted in cows' milk is of low pathogenicity for man and fails to produce appreciable disturbance, but can, and does, produce an immunity towards the more virulent types of porcine and caprine origin.

A reference is made to an experiment reported by Coolidge. Seven human beings drank one and a half pints of milk daily from infected cows over a period of eight weeks. No febrile states were observed.

The evidence brought together points in the opinion of the author : first, to the stability of the bovine race of *Br. abortus* as isolated directly from bovines, and second, to a number of divergent pathogenic characters shown when the organism is isolated from undulant fever

cases in man. Only a few of these strains have distinctive bovine characters.

Whenever the animal host is known, as the goat and sheep in Europe and the cow and swine in America, an active campaign should be waged to free the herds of the infection.

D. Harvey.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE. 1930. Feb. Vol. 23. No. 4. pp. 559–572 (Sect. of Epidemiol. & State Med. and Sect. of Trop. Dis. & Parasit. pp. 19–32). [5 refs.] **Discussion on Brucella Infections in Man and Animals.** [DALRYMPLE-CHAMPNEYS (W.), DUNCAN (J. T.), PUGH (L. P.), and others.]

Captain W. Dalrymple-Champneys, who opened the discussion, spoke mainly from the epidemiological side and referred to the exhaustive Report of the Ministry of Health, for which he was responsible. The evidence to hand justifies a conclusion that cases of Brucella infection have been caused by the drinking of infected cows' milk; yet this is not the whole case and one must still ask, "Has this infection been transmitted by drinking the infected milk or by direct contact with the cow, or has an infection originally derived from cattle been transmitted direct from man to man?" As regards the elimination of danger from cattle, pasteurization of milk is only a palliative; he considers that the best method of eliminating the disease from a herd is by the agglutination test and elimination of reactors, and that the use of living vaccine is no longer necessary and is moreover fraught with danger.

Dr. Duncan discussed the problem principally from the bacteriological standpoint. He agreed that the best method of diagnosis was by isolation of the germ, but in numerous cases this may be impossible or unsuccessful and one has then to rely on the agglutination test. Briefly, he considers that there is little reason to believe that non-specific reactions are of common occurrence; on the other hand, latent infections may occur with marked agglutination reaction, but no clinical symptoms. He is also of opinion that, using trustworthy suspensions, a fairly low titre of agglutination may be accepted and that heating of the sera is not necessary and may even reduce specific agglutinins. As regards differentiation of species, he advises the use of three common differentiating methods: (1) the liberation of hydrogen sulphide from media; (2) the bacteriostatic action of certain dyes; and (3) serological distinctions.

Mr. Pugh spoke from the veterinary standpoint and dealt principally with the prophylactic vaccination of cattle with living cultures. He pointed out that the Ministry of Agriculture recommends that when the disease has broken out in a herd the affected animals should be isolated and the remainder tested for agglutination. Reactors are then isolated and treated as a separate unit. If this fails, live vaccine is employed and by this method losses have been very greatly reduced. Mr. Pugh is of opinion that the elimination of *Br. abortus* infection in this country in cattle by isolation and destruction of reactors is economically impracticable and that the risk of producing carriers after vaccination with living cultures is not great.

D. H.

GIORDANO (Alfred S.). *Brucella abortus* **Infection in Man. The Intradermal Reaction as an Aid in Diagnosis.**—*Jl. Amer. Med. Assoc.* 1929. Dec. 21. Vol. 93. No. 25. pp. 1957–1958. With 2 text figs. [9 refs.] [Med. Lab., South Bend, Indiana.]

The author points out the difficulties in diagnosis of this disease and refers to several cases in his experience in which blood culture was positive, yet the agglutination test was negative. He refers to Burnet's intradermal test, in which the filtrates of broth cultures were used; other workers have used killed salt suspensions of Brucella for injection.

In his early work he used the filtrates of broth cultures, but found that the reactions were not of sufficient specific value. On the other hand, using heat-killed salt suspensions, strong reactions occurred in known cases and not in controls. The material used in his investigations consisted of the following: 25 proved cases of undulant fever, 75 tuberculous people, 20 normal people. The suspensions were made from recently isolated strains of *Br. abortus* grown on Huddleson's liver agar for 48 to 64 hours and graded at a density of 1/1,000 on United States Public Health standard. 0·2 cc. was injected intradermally.

A positive reaction appeared, as a rule, in from 12 to 48 hours. A small "boil" formed at the site of injection, with some induration; these boils contained neither pus nor bacteria. A small scar with an area of discolouration may last for some months. A second series of cases, with doses of 0·5 to 0·1 cc., is now in process of trial and gives quite definite reactions.

The 25 cases of undulant fever all gave a positive reaction; of 100 controls only one was positive.

At the discussion on the paper the opinion was expressed that it would not be right to abandon the agglutination test for the intradermal, but that both might be usefully employed in doubtful cases where blood culture had failed.

D. H.

GIORDANO (Alfred S.) & SENSENICH (R. Lloyd). *Brucella abortus* **Infection in Man. A Clinical Analysis of Thirty-Five Cases.**—*Jl. Lab. & Clin. Med.* 1930. Feb. Vol. 15. No. 5. pp. 421–436. With 6 text figs. [17 refs.] [Med. Lab., South Bend, Indiana.]

This paper and three following (CARPENTER, LYNCH, MEYER, see below) were read at a symposium on clinical pathology with special reference to undulant fever.

Most of the work referred to has been already published by the authors, but certain points were emphasized and these are noted here. A discussion followed the reading of the papers, and it is interesting to note that there was general agreement that the prevalence of undulant fever in the States had first been noted by the bacteriologists, but that now cases were being detected all over the country on clinical grounds, supported by bacteriological evidence. It was hinted, however, that clinical diagnosis, which had at first ignored the disease, was now swinging to the other extreme and cases were being diagnosed as undulant fever which were not really so, thus tending to exaggerate its prevalence.

The authors consider that it is wrong to presume, because *Br. abortus* and *Br. melitensis* are closely related bacteriologically, that therefore they should produce identical clinical symptoms in man. They consider that a further study of *abortus* infection in man in 35 cases emphasizes the relative infrequency of the classical undulant type of temperature curve of *melitensis* infections.

The number of people infected by actual handling of cultures or diseased animal tissues was much less than of those who could only have been infected by drinking milk from infected cows. Five patients were farmers, one a veterinary surgeon, one a mechanic who also raised pigs, and the remaining 28 were in urban occupations and had all consumed raw milk.

The clinical symptoms were very varied; the acute type in the authors' experience is of more common occurrence than the more usually described long-drawn-out chronic type. The cases are classified according to the predominant symptoms and the body tissues attacked. Brief histories are given of typical cases of each type which are classified as septic, arthritic, neurologic, visceral and glandular. The individual symptoms are discussed in detail.

For diagnosis the agglutination reaction is regarded as one of the most reliable aids; successful blood culture was most difficult to obtain in this series of cases.

D. H.

HEGLER (C.). Ueber undulierendes Fieber, insbesondere durch *Bacterium abortus* Bang. [**Undulant Fevers and especially Abortus Fever.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Vol. 33. No. 3. pp. 256–265 (340–349). With 4 text figs. [1 ref.] [St. George's General Hosp., Hamburg.]

The author remarks on the disproportion between the widespread infection of cows with *Br. abortus* and the rarity of cases among human beings and especially children who consume cows' milk. For instance, in Schleswig Holstein between 20 and 30 per cent. of the cattle are infected and 25 cases of Bang disease were diagnosed there in the spring of 1929. Kiel had ten cases and Hamburg seven; six of these were under the care of the author.

A careful clinical description, with temperature charts, is given, and it is noted that the frankly undulant type of fever curve is rare, not nearly so well marked as in *melitensis* infection. Even when fever was high, the general condition was good, the patient lying comfortably with little or no pain and with a good appetite. There was, as a rule, enlargement of the spleen and the liver. Two cases ended fatally; both died of cirrhosis of the liver.

In the author's opinion diagnosis is possible, but not easy, on clinical symptoms alone, but is confirmed by the agglutination reaction. In none of his cases was the bacterium isolated from the blood. In melitensis fever there is a shorter incubation period, much greater prostration and general disturbance, sleeplessness, bad headaches, more rapid pulse, more frequent and violent joint pains, neuralgia and orchitis than in *abortus* infections.

He urges the routine testing of all sera sent for examination against *abortus* emulsions.

D. H.

OTERO (Pablo Morales). **Experimental Infection of** *Brucella abortus* **in Man. Preliminary Report.**—*Porto Rico Jl. of Public Health & Trop. Med.* 1929. Dec. Vol. 5. No. 2. pp. 144–157. With 2 charts. [22 refs.] [School of Trop. Med., Univ. of Porto Rico, San Juan.] [Summary appears also in *Bulletin of Hygiene.*]

The author records a series of experiments in which various strains of *Brucella* were fed to human volunteers, who were submitted to a detailed clinical and bacteriological examination before the feeding, and were kept under observation in hospital for several weeks thereafter. In all, seven experiments were carried out. In five cases a single feeding was given, but was repeated after two or three weeks when no symptoms developed. Of these five persons, one developed undulant fever eighteen days after the second ingestion of a porcine strain of *Brucella* (Hygienic Lab. 483), and the organism was recovered from the blood on the 5th day of disease. The four persons fed on other strains developed no characteristic symptoms and yielded no positive blood cultures. [The particulars of the four strains employed are disappointingly scanty. One is recorded as " Bovine type Hygienic Lab. 456 " ; one as " Strain No. 21, School of Tropical Medicine," which is stated to have been an old laboratory strain ; one as " Strain isolated in Porto Rico—Porto Rico No. 1 " ; and one as " 428."]

Two further volunteers were given daily feedings until the organisms could be isolated from the faeces by Amoss's method. In one case the bovine strain was employed, without result. In the other case the porcine strain (483) was administered on five successive days. The patient fell ill on the 8th day after the fifth feeding. He developed fever 3 days later and the organism was recovered from the blood on the 5th day of the fever (the 8th day of the disease ?). [There are several minor discrepancies in the dates given in the text.]

W. W. C. Topley.

LUSENA (Marcello). Un focolaio di febbre ondulante e di aborto epizootico in Provincia di Padova. Osservazioni ed esperienze sulla variabilità delle Brucelle agli effetti batteriologici e diagnostici. [**A Focus of Undulant Fever and of Epizootic Abortion in Padua.**]—*Bol. Istituto Sieroterap. Milanese.* 1929. Nov. Vol. 8. No. 11. pp. 743–759. German summary p. 759. [13 refs.] [Inst. of General Clin. Med., Univ., Padua.]

An interesting series of cases is here presented together with evidence in favour of FAVILLI's thesis of the transformation of the true *Br. melitensis* to *paramelitensis* and possibly *abortus*. Five out of six members of one family, a veterinary surgeon and two others, in all eight individuals, suffered from attacks of fever of an undulant type in Creola near Mestrino (Padua), where undulant fever is not known, but abortion among cattle is common. The veterinary surgeon had, shortly before the onset of his illness, attended to an aborting cow, and other cows belonging to the affected family had also aborted. The chief distinctions between the organisms are given as follows : Typical *Br. melitensis* shows a maximum agglutinability to specific serum, negative to non-specific ; atypical *melitensis* is less agglutinable with the former and also gives positive non-specific agglutination ; *Br. paramelitensis* gives agglutination slight or nil with specific serum and up to a high titre with non-specific. *Br. paramelitensis* has also a

marked anticomplementary action. The author is convinced that by age this transformation from left to right in the scale takes place in the course of a few days. The organism isolated in Mestrino appeared to be a typical *Br. melitensis* ; after 30 days it gave the reaction of *Br. paramelitensis*, but after 4½ months those of an intermediate stage, showing that the shift can also occur in the reverse direction.

H. Harold Scott.

PIVA (Giuseppe). Distribuzione e frequenza della febbre di Malta (febbre ondulante) in Provincia di Bologna. [**Distribution and Prevalence of Undulant Fever in the Province of Bologna.**]—*Arch. Ital. Sci. Med. Colon.* 1929. Dec. 1. Vol. 10. No. 12. pp. 594–600. With 1 map in text. English summary (6 lines) p. 600. [Inst. of Trop. Path., Univ., Bologna.]

In the three years 1924–27 Dr. SARTORI reported 77 cases of undulant fever, and between January 1st, 1927, and the end of December, 1928, the author saw another 86 cases. Many of the patients had been in contact with cows which had aborted ; others had partaken of milk or milk products from such cows. Most were between 18 and 50 years of age, but one was a child of 7 years, and in one instance a family of nine persons was attacked. Of the 86, 60 were men, 25 women, and one a child. Diagnosis was made by agglutination, which was positive up to 1 : 1,000 with both *Brucella melitensis* and *Br. abortus*.

H. Harold Scott.

ROGER (Henri). La neuromélitococcie. [**Nervous Complications of Undulant Fever.**]—*Marseille-Méd.* 1929. Nov. 15. Vol. 66. No. 32. pp. 589–590.

——. Les complications cérébrales de la mélitococcie.—*Ibid.* pp. 591–601. [2 refs.]

——. Les complications médullaires de la mélitococcie.—*Ibid.* pp. 602–616. [9 refs.]

—— & ALBERT-CREMIEUX. La radiculonévrite mélitoccique avec xanthochromie et réaction albuminocytologique intense du liquide céphalorachidien.—*Ibid.* pp. 617–634.

—— & RAYBAUD (Antoine). La sciatique mélitococcique.—*Ibid.* pp. 635–645. [15 refs.]

This number of the *Marseille-Médical* is devoted to neurology and deals with the nervous complications of *Br. melitensis* septicaemia. In a foreward the authors point out how much more common undulant fever is in the south of France now than before the war. A study of several cases of recent years has compelled them to admit a neurotropism of the micrococcus not previously suspected. In the papers presented the cerebral, the spinal, nerve root and sciatic complications are passed in review.

In the first paper M. Henri Roger describes several cases which showed some form of nervous symptom of central origin. The first case had occasional aphasia followed by facial paralysis. The second case had very marked wasting of groups of muscles, difficulty

in walking and vertigo; the diagnosis was cerebral arteritis due to *melitensis*. Case 3 showed paraplegia with involvement of sphincters and positive Babinski sign.

Then follows a description of three cases of undulant fever in which the spinal cord was involved, and two in which there was inflammation of the nerve roots, with marked paralysis of the lower limbs, without involvement of sphincters.

As regards infection of the sciatic nerve during or following an attack of undulant fever, the authors quote the literature. One patient, a railway employee who had been carrying on with his work although out of sorts, developed an acute attack of sciatica in the right leg; he was found to be suffering from undulant fever, probably of some months' duration; the agglutination reaction for *Br. melitensis* was strongly positive.

D. H.

LISBONNE (M.) & BALMÈS. Chimiothérapie de la mélitococcie expérimentale par les dérivés de l'acridine. [**Treatment of Experimental Brucella Infection by Acridine Derivatives.**]—*C. R. Soc. Biol.* 1929. Nov. 22. Vol. 102. No. 31. pp. 573–574.

The drug employed in these experiments was gonacrine. The authors state that it has been shown that undulant fever in man in the south of France is spread by sheep [see this *Bulletin*, Vol. 23, p. 349]; therefore they chose these animals for experiment. Three sheep were given an intravenous dose of 10,000 living bacteria. One died 25 days later with pneumonia, the two others showed no clinical signs or symptoms of disease, but blood cultures at fortnightly intervals were positive. The agglutination tests, negative at the commencement, became positive later on in a dilution of 1/100 to 1/1000. No other sign of infection could be detected during three months' observation.

Gonacrine injections, which produced somewhat violent reactions, were given, and, although the blood culture remained positive, yet milk culture, which had been positive, became negative after four injections of 1/100 solution. The dose employed was 1 cgm. per kgm. body weight.

The authors apologize for the paucity of their observations due to lack of laboratory facilities, but consider that their results justify further work on the same lines.

D. H.

HARDY (Albert V.), HUDSON (Margaret G.) & JORDAN (Carl F.). **The Skin as a Portal of Entry in** *Br. melitensis* **Infections.**—*Jl. Infect. Dis.* 1929. Oct. Vol. 45. No. 4. pp. 271–282. [25 refs.] [Dept. of Preventive Med. & State Hyg. Labs., Univ. of Iowa, Iowa City.]

It has been suggested that infection with undulant fever in persons employed in packing factories may take place through abrasions of the skin of the hands or even through the normal skin. Moreover, on farms it has been noted that the persons who contract undulant fever are the men who handle the infected stock, even though those who escaped infection drank more raw milk.

In the authors' experimental work guineapigs were used. Two tests of infection were employed, the development of agglutinins and the recovery of the organism post-mortem. Two varieties of *Br. abortus* were used, both isolated from human cases. One, identified as a porcine strain, gave very marked lesions in guineapigs; the patient from whose blood it had been isolated was a farmer 20 out of whose 21 sows had aborted. The second variety was of bovine origin, gave the characteristic growth of the bovine strain and required an atmosphere of CO_2 for initial culture. It had little effect on guineapigs.

In one group of guineapigs an area of skin was shaved and abraded, in another group the skin was shaved without abrasions and in another the hair was merely clipped; the infecting dose was applied by means of a glass rod. It was found that guineapigs which did not show agglutinins in their blood, if killed subsequently, showed no evidence of infection. The two strains, porcine and bovine, did not show any marked difference in ability to infect. Of the guineapigs with abraded skin 100 per cent. were infected in both series; in those with shaved skin but not abraded 95 per cent. were infected by the porcine strain and 82 per cent. by the bovine; in those in which the hair was only clipped 81 per cent. porcine and 73 per cent. bovine, were infected.

In a further series of guineapigs fed by the mouth with infective material 17 per cent. of the porcine series were infected and 33 per cent. of the bovine. It was thus shown that infection was more readily obtained through the skin than by the oral route.

An epidemiological study of the disease was made in several pork factories, and it was clearly brought out that practically all the cases of undulant fever occur in the men who are actually engaged in the handling of the freshly cut tissues of the pig, although it was not possible to determine whether this infection took place through abrasions or through the normal skin.

D. H.

HUDDLESON (I. Forest) & HALLMAN (E. T.). **The Pathogenicity of the Species of the Genus *Brucella* for Monkeys.**—*Jl. Infect. Dis.* 1929. Oct. Vol. 45. No. 4. pp. 293–303. [4 refs.] [Michigan Agric. Experiment Station, East Lansing.]

The authors think that BURNET's failure to infect monkeys with *Br. abortus* may have been due to the small number of animals or to the use of animals naturally resistant. They employed freshly isolated strains of bacteria from different hosts and from infective material, such as freshly drawn milk or the aborted foetus.

The monkeys used were all *Macacus rhesus*. They were exposed to infection by the oral administration of infective material; infection was gauged by the appearance of agglutinins in the blood and by the isolation of the organism from the heart blood. If infection did not result from a single exposure the dose was repeated several times. Protocols of all the experiments are given and the results are tabulated.

Seventeen monkeys were exposed to infection with *Brucella* strains, eight of the bovine variety, seven porcine and four *melitensis*.

The experiments indicate that *abortus* (bovine) does not possess a high degree of virulence for monkeys: only after repeated feedings of infective milk was infection produced in one of three. *Abortus* strains from human cases produced slight infections in two monkeys, no infection in the third. On the other hand, *Br. abortus* of porcine origin

showed a high degree of virulence for monkeys, one exposure being sufficient to infect each of the seven monkeys used. In fact, this species appeared to be even more virulent for monkeys than *Br. melitensis*.

D. H.

MEYER (K. F.) & EDDIE (B.). **Further Studies on the Pathogenicity of *Br. abortus* and *Br. melitensis* for Monkeys.**—*Proc. Soc. Experim. Biol. & Med.* 1929. Dec. Vol. 27. No. 3. pp. 222–224. [George Williams Hooper Foundation for Med. Research, Univ. of California, San Francisco.]

In this investigation 48 cultures of the Brucella group were employed and 74 Rhesus and 14 Cynomolgus monkeys. Oral administration in single doses of *Br. abortus*, variety "bovis," produced non-febrile infections in 24 Rhesus monkeys, followed by the production of very definite agglutination reactions in the serum. Blood cultures were negative, but that these were true infections was shown when monkeys were sacrificed from the 34th to the 52nd day, when the infecting organism was readily recovered from the tissues. Very large doses were necessary—from 7 to 400 millions and in some experiments many billions. The larger the dose the more pronounced is the serum reaction. The incubation period, i.e., the period that elapsed before agglutinins appeared in the blood, varied from 9 to 30 days. A cutaneous application of 20,000 bacteria has resulted in infection.

The type "suis" of bovine or porcine origin, on the other hand, in doses of 100 million bacteria by the mouth, produced a febrile disease, with anatomical lesions resembling those of a *Br. melitensis* infection. The milk of the cow which supplied one of these "suis" strains had been consumed by a group of people without any bad effects.

Tunisian strains of *Br. melitensis*, fed to monkeys in doses of 100 million bacteria, gave rise to a febrile disease characteristic of this group of organism.

Three *Br. abortus* type "suis" strains isolated from cases of fever in man did not exhibit any striking pathogenicity or marked febrigenic properties, either by feeding or by cutaneous or intravenous injection.

The ingestion of heat-killed *abortus* bacilli, with or without bile, is antigenically ineffective in monkeys or in rabbits.

Ten per cent. of the monkeys tested possessed a marked immunity against Brucella infections by the alimentary tract.

Animals which react to the oral administration of virulent *abortus* organisms with moderate and usually transitory serum reactions resist subsequent feeding infections with *Br. abortus*, "bovis" or "suis," but not with Tunisian *Br. melitensis*.

Continuous ingestion of small numbers of *abortus* may lead to mild unrecognized "silent" (inapparent), yet immunizing, infections.

D. H.

CARPENTER (Charles M.) & BOAK (Ruth). **The Laboratory Diagnosis of Undulant Fever.**—*Jl. Lab. & Clin. Med.* 1930. Feb. Vol. 15. No. 5. pp. 437–443. [7 refs.] [Dept. of Comparative Path. & Bact., Cornell Univ., Ithaca, N.Y.]

Carpenter discusses the question of laboratory diagnosis and the differentiation of the types of organisms. Although investigators have suggested various methods of differentiating *melitensis* from *abortus*,

in his experience, apart from the agglutination absorption test, these methods cannot be depended upon. By the use of the absorption test it has been shown that the majority of the cases in America are due to *abortus* infection.

The author then discusses the laboratory procedures in establishing a positive diagnosis, taking these in the following order :—

1. Agglutination test.
2. Complement fixation test.
3. Bacteriological examination of the blood.
4. The absorption test.
5. The blood count.

The most interesting part of his paper is a description of his methods of carrying out the bacteriological examination of the blood.

It is recommended that 20 cc. of blood be taken as early in the fever as possible and when the temperature is high ; no anti-coagulant should be used. A meat infusion agar (preferably made from liver) of a pH of 6·8 or 7 should be employed. Four tubes of slant agar may be inoculated and two plates poured to which 2 cc. of blood are added. Two of the slants and one of the plates are incubated in a jar in which 15 per cent. of the air has been replaced by 10 per cent. of carbon dioxide ; one of the slants is sealed with wax and placed along with the other slant and plate in the incubator under normal conditions. Cultures should not be discarded for 20 days as growth may be very slow. The remainder of the blood is injected into two guinea-pigs.

A later method is to inoculate a flask of liver broth with the blood and inoculate a guineapig from the culture after 3 days' incubation.

D. H.

LYNCH (Frank B.) & CALLAN (Annette M.). **Some Observations on the Agglutination of** *Br. abortus.*—*Jl. Lab. & Clin. Med.* 1930. Feb. Vol. 15. No. 5. pp. 444–446. [4 refs.] [William Pepper Lab. of Clin. Med., Univ. of Pennsylvania, Philadelphia.]

During a period of eighteen months when all sera sent in to the laboratory for diagnostic tests were put up against typhoid, paratyphoid and *abortus* emulsions, seven gave a strong positive reaction for the last. Two of these sera were from cases in the hospital and five were sent in for diagnosis from outside.

The culture was selected by tests with positive sera and subcultured on 3 per cent. glycerine, 0·1 per cent. glucose agar. Several large slopes of this medium were inoculated and incubated for 72 hours ; the growth was then washed off with sterile saline and killed by heating to 55° for 45 minutes and filtered through wool. The emulsion was standardized by comparison with a staphylococcal suspension of three billion organisms per cc. It was stored in the ice box for future use. The agglutination test was carried out in a water bath at 55° C. for two hours.

The authors contend that by the use of an antigen prepared in this way they got very constant and specific results.

D. H.

MEYER (K. F.) & EDDIE (B.). **Notes on the Bacteriology of the Brucella Group.**—*Jl. Lab. & Clin. Med.* 1930. Feb. Vol. 15. No. 5. pp. 447–456. [27 refs.] [George Williams Hooper Foundation for Med. Research, Univ. of California, San Francisco.]

The authors give a résumé of recent work on the differentiation by the agglutinin absorption test and find that by its use many strains,

especially of European origin, cannot be "placed." The test for pathogenicity in animals is of value in differentiating porcine *abortus*, but may give confusing results. Some strains of caprine *melitensis* may give porcine results in guineapigs, and some porcine strains may show little or no pathogenicity for guineapigs. The thermo-agglutination tests also they found unsatisfactory. Studies on the nutritive substances and growth accessory factors, the effect of salts and nature of enzymes, are now being undertaken, but so far have not furnished definite proof that biologic means may distinguish Brucella types. The work of McAlpine on metabolic differences, such as the use of glucose and the necessity for CO_2, and Huddleson's work on growth differences by means of dye media are then discussed and have been repeated by the authors; over 130 cultures of Brucella have been tested against dyes and have been classified as follows:—

Twenty cultures from bovine and one from porcine sources in Switzerland fall into the "bovis" class according to their reaction with dyes. Of eight cultures obtained from Germany as true *abortus* three behave like *melitensis* and five like bovis types. Of the four Hungarian cultures one behaves like a *melitensis*. Three Italian strains were all classified as bovis types.

Human Cultures.—In general, strains classified as *melitensis* reacted as such on dye media; those identified by agglutinin absorption tests as *abortus* were either linked with the "suis" or with the bovis type. With one exception 20 strains from Iowa are "suis" strains; some of the New York strains fall into the same category, while the Michigan cultures are mostly bovis types. Twelve Denmark strains react like bovis and four from Tunis like *melitensis* types.

The glucose utilization tests the authors found to be disappointing on the whole, but, speaking generally, the feeble biochemical activity of the majority of *abortus* strains contrasts sharply with the vigorous carbohydrate activity of certain porcine and *melitensis* strains.

Then follows an account of experiments on monkeys recently carried out. The general conclusion that *Br. abortus* is definitely less pathogenic for monkeys than *melitensis* was confirmed. The ingestion of heat-killed *abortus* bacilli with or without bile was found to be antigenically ineffective in monkeys and rabbits.

The authors maintain that further work is necessary and this is in hand. Final conclusions cannot be drawn on the evidence now available.

D. H.

Favilli (G.). Sur l'utilité d'associer la thermo- à la séroagglutination dans le sérodiagnostic de la fièvre ondulante. [**Relation of Thermo- to Sero-Agglutination in Diagnosis of Undulant Fever.**]—*Bol. Sezione Ital. Soc. Internaz. di Microbiologia.* 1929. Jan. Vol. 1. No. 1. pp. 21–23. [3 refs.] [Inst. of General Path., Univ., Florence.]

The author points out that one great difficulty in carrying out agglutination tests with *Br. melitensis* is that reliable strains may not be to hand.

One method of avoiding this is to employ controls with sera of known titre, but this also may not eliminate all sources of error.

The author suggests the use of the following simple procedure, utilizing the phenomenon of thermo-agglutinability. He has found

invariably that the degree of thermo-agglutinability is inversely proportional to the degree of agglutinability by immune sera. It flolows that one should select for agglutination tests those strains which show no trace of thermo-agglutinability. The technique is simple. Emulsions of the various strains are prepared in normal saline and heated in the water bath at a temperature just over 80° C. for 15 to 20 minutes. The emulsions are then examined by the naked eye and a loopful is also examined in the agglutinoscope. All strains showing even a trace of clumping should be rejected, and the strain which gives a homogenous emulsion should be retained for use in agglutination tests.

D. H.

WIGMORE (J. B. A.). **Note upon the Production of Brucella Agglutinins.** —*Jl. Roy. Army Med. Corps.* 1930. Jan. Vol. 54. No. 1. pp. 5–10. [6 refs.]

The author refers to the conflicting opinions regarding the value of the agglutination and absorption of agglutinin tests in differentiating infections or strains of the Brucella group. With a view to assisting in the diagnosis of cases he set himself to find :—

1. An anti-serum which would agglutinate all available strains of the group.
2. Three anti-sera which would agglutinate all strains of *melitensis*, *paramelitensis* and *abortus* respectively.
3. A strain from which a suspension could be made which would be agglutinated by all sera of Brucella-group infections.
4. Three strains, i.e., one of *melitensis*, one of *paramelitensis* and one of *abortus*, of which suspensions could be made which would each be agglutinated by all anti-sera of their homologous species.

Of these, for general purposes, 2 and 4 are most to be desired.

With this end in view, four strains of *melitensis*, three of *paramelitensis* and three of *abortus* were taken, and for each strain a high titre rabbit serum was obtained by graduated intravenous doses of killed broth cultures. Agglutinable cultures were also prepared by repeated subculture in broth and by the final addition of formalin to the standardized emulsions of a density comparable to those issued by the Oxford Standards Laboratories.

A series of comparative agglutination tests was made with :—

1. The sera of the ten rabbits as prepared.
2. The Oxford standard sera for *melitensis* and *abortus*.
3. The sera from two human cases of Brucella infection.

These were tested against the following cultures :—

1. Six strains of *melitensis*.
2. Three strains of *paramelitensis*.
3. Seven strains of *abortus*.
4. The Oxford standard cultures of *melitensis* and *abortus*.

The mixtures were incubated at 55° C. for 4½ hours and then read ; dilutions lower than 1/125 were not employed.

The results, given in a table, were remarkable in that the sera of the human cases showed greater agglutinating power than did the sera of the immunized rabbits ; also the serum of a rabbit immunized with a specific strain may not agglutinate this strain, but may agglutinate other strains of the same or closely allied species. It follows, therefore,

that a serum prepared by immunizing a rabbit with any killed strain of Brucella group may fail to agglutinate an organism recovered from a case of undulant fever.

It is proposed now to immunize rabbits with living cultures, in the hope that these may produce a more active response.

D. H.

NODA (Magoichi). **On the Optimum Hydrogen Ion Concentration in Acid Agglutination with the Brucella Group.**—*Eisei Densenbyoshi* (*Jl. Hyg. & Infect. Dis.*). 1929. June. Vol. 25. No. 6. [Summarized in *Japan Med. World.* 1929. Sept. 15. Vol. 9. No. 9. pp. 296–297.]

The author refers to work already published claiming that the determination of the optimum hydrogen ion concentration in acid agglutination may serve as one means of differentiation between Brucella strains. ECKER and SIMON have already applied this test and reported that there was no difference in the reaction between *abortus* and *melitensis*. The author repeated these experiments with four strains of Bang's organism and one of *Br. melitensis*, and found that the optimum hydrogen ion concentration and the degree of the reactions were practically identical for both organisms.

D. H.

DE ANTONI (Vittorio). Trasformazioni in relazione allo sviluppo e con agenti chimici, nei batteri della specie *Br. melitensis*. [**The Effect of Growth and of Chemical Agents in changing the Characters of** *Brucella melitensis*.]—*Bol. Istituto Sieroterap. Milanese.* 1929. Dec. Vol. 8. No. 12. pp. 787–800. German summary pp. 800–801. [1 ref.]

The author having noticed, in common with others, that *Br. melitensis* seemed to undergo spontaneous alterations, such as acquiring non-specific agglutinability, carried out a series of experiments to test whether this resulted from special substances in the medium itself or from the products of bacterial growth. He used three strains, one from the Milan Serotherapy Institute, one from Padua, and a Pasteur strain supplied from the Pathological Institute, Florence.

He found that prolonged growth in broth led to gradual change from typical *Br. melitensis* to *paramelitensis*, specific agglutinability diminished and non-specific increased. He next varied the proportions of peptone and salt and made up three dilutions by addition of the meat extract, of normal saline, or of distilled water. Development was greatest with the first, least with the last diluent. With peptone, between the limits of 5·0 and 0·4 per cent., growth was normal, beyond either limit it was impeded and a strength of 20 per cent. killed the organism. Varying the salt, he obtained normal growth between 1·0 and 0·3 per cent.; greater or less amounts than these were inimical, and at 3 per cent. or over the organisms died. He observed that the rapidity and intensity of the change to non-specific agglutination varied directly with the luxuriance of growth; the heavier the growth the more rapid the change, from which he infers that it depends on substances formed by the bacilli themselves. Lastly, the addition of drugs such as quinine or plasmochin in small quantities caused the *paramelitensis* characters to appear much more rapidly (within 5 days). Since this change occurs *in vivo* as well as *in vitro*, if patients present themselves with symptoms suspicious of undulant fever and the agglutination reaction is negative, it may be that they have a short time previously been taking quinine or plasmochin and enquiry should be made with this in mind.

H. Harold Scott.

McALPINE (James G.), PLASTRIDGE (Wayne N.) & BRIGHAM (George D.). **Studies on the Metabolism of the Abortus-Melitensis Group. 5. Factors influencing Sugar Utilization.**—*Jl. Infect. Dis.* 1929. Dec. Vol. 45. No. 6. pp. 485–489. [2 refs.] [Agric. Experiment Station, Storrs, Connecticut.]

The senior author and SLANETZ have shown in a previous paper [this *Bulletin*, Vol. 25, p. 517] that when first isolated from the human or animal body, the porcine, human and *melitensis* strains are capable of utilizing at least 3 per cent. of the available glucose, while the bovine strains of *Br. abortus* use little or no sugar in their metabolism. It has now been found that if the sugar-utilizing strains are grown on plain Fairchild agar for many generations, the property of destroying glucose may be lost. Growth on a liver-infusion agar tends to restore the glucose-utilization property, but this recovery is only transient. However, after three transfers in liver broth a very heavy growth was obtained with pellicle and sediment. The name "mucoid forms" was given to such strains and in these the glucose-utilizing power is restored. The "mucoid forms" of the bovine strains tested did not utilize glucose.

D. H.

FICHERA (S.) & MAUGERI (F.). Untersuchungen über Immunisierung gegen Mittelmeerfieber. VI. Mitteilung. Ueber die Toxizität verschiedener Impfstoffe gegen Mittelmeerfieber. [**Immunization against Mediterranean Fever. Toxicity of Various Vaccines.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1930. Vol. 65. No. 3/4. pp. 352–356. With 2 graphs in text. [4 refs.] [Med. Clinic, Univ., Catania.]

The authors refer to previous studies on the subject carried out by SANFILIPPO and others in the same laboratory. The cultures were the same as were used previously, but mice and rats were employed instead of goats. The vaccines were prepared as usual by washing off the growth on agar cultures or plates, but various methods of killing the bacteria were employed. The vaccines were then injected into mice and rats and the minimal lethal dose estimated. The various agents employed were heat (60° C. for 2 hours), ether, peroxide of hydrogen, carbolic acid, formalin, sodium fluoride, chloroform, chloroform vapour, yatren and lugol solution. With mice it was found that the most toxic preparations were those treated by carbolic acid, chloroform and formalin; slightly less toxic were the heat, ether and fluoride killed; but the least toxic of all was the yatren-treated solution—this was eight times less toxic than the carbolic.

In rats similar results were obtained, although the differences were not so marked; formalin and chloroform produced the most toxic vaccine and chloroform vapour and yatren the least toxic.

D. H.

RODENWALDT (E. R. K.) & COHEN (A. J.). Febris undulans (Malta koorts) in Nederlandsch-Indië. [**Undulant Fever in Dutch East Indies.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1929. Oct. 1. Vol. 69. No. 10. p. 1014.

A short note, simply stating that a case of febris undulans was seen at Maland (Java), being the first in the Dutch East Indies. In a postscript a second case is mentioned. A detailed report—if possible with epidemiological data—is to be expected.

W. J. Bais.

BETHOUX (L.). Fièvre de Malte traitée et guérie par des injections intraveineuses de trypaflavine. [**Undulant Fever treated by Intravenous Injections of Trypaflavin.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1930. Feb. 17. Year 46. 3rd Ser. No. 5. pp. 206–210. With 1 chart in text. [4 refs.]

The illness began on March 1st. The patient was admitted on March 18th and *Br. melitensis* isolated from blood on April 10th. Trypaflavine injections, 10 cc. of a 1 per cent. solution, were given on April 11th, 13th, 16th and 23rd. On April 16th the temperature fell and the patient rapidly improved and left hospital on May 20th. The author recommends a trial of this drug.

D. H.

JOHNSSON (Vera). Un cas de "febris undulans" de Bang avec complications nerveuses.—*Acta Med. Scandinavica.* 1929. Oct. 17. Vol. 72. No. 2. pp. 93–103. With 1 text fig. [2 pages of refs.]

STIEBEN (W.). Zur Frage über die Verbreitung des Febris undulans in Turkestan. —*Pensée Méd. d' Usbéquistane et de Turqumenistane.* 1930. Feb. No. 5. pp. 58–59. [3 refs.] [In Russian. German summary p. 99.]

DENGUE AND PAPPATACI FEVER.

SIMMONS (James Stevens), ST. JOHN (Joe H.) & REYNOLDS (Francois H. K.). **Dengue Fever transmitted by** *Aëdes albopictus*, **Skuse.**—*Amer. Jl. Trop. Med.* 1930. Jan. Vol. 10. No. 1. pp. 17–21. [9 refs.] [Bureau of Science, Manila, P.I.]

——, —— & ——. **Transmission of Dengue Fever by** *Aëdes albopictus*, **Skuse.**—*Philippine Jl. Sci.* 1930. Feb. Vol. 41. No. 2. pp. 215–231. With 2 charts, 1 fig. & 1 plate. [12 refs.] [Bureau of Science, Manila, P.I.]

In Manila *Aëdes albopictus* (Skuse) is, next to *Aëdes aegypti*, the most common mosquito. It was present in very large numbers during the last epidemic of dengue. So far, although it has been suggested that this common Oriental mosquito may be a carrier of dengue, experimental proof is lacking. In the author's laboratory, during the investigation, this mosquito was nicknamed the "one striper," in view of the single broad longitudinal white stripe on the thorax which distinguishes it from *A. aegypti*. It has similar breeding habits to *aegypti* and was readily bred in the laboratory, so that a supply of "clean" mosquitoes was easily obtained. Lot 29 of these insects was fed on a human volunteer in the first day of an attack of dengue and thirteen to twenty-two days later on five normal individuals. The number of mosquitoes in the box was gradually reduced from 12, 10, 8, 3 to 1, and infection resulted in each case. Further laboratory-bred mosquitoes were fed on the man in whom dengue had been produced by the single insect, and they again produced an attack of dengue in two fresh volunteers. Abstracts of the cases, which were all typical, are given.

The results obtained clearly show that *A. albopictus* is just as efficient a transmitter of the virus of dengue as is *A. aegypti*.

D. Harvey.

ST. JOHN (Joe H.), SIMMONS (James Stevens) & REYNOLDS (Francois H. K.). **Transmission of Dengue Virus from Infected to Normal** *Aëdes aegypti.*—*Amer. Jl. Trop. Med.* 1930. Jan. Vol. 10. No. 1. pp. 23–24. [Bureau of Science, Manila, P.I.]

——, —— & ——. **Transmission of the Virus of Dengue Fever from Mosquito to Mosquito.**—*Philippine Jl. Sci.* 1930. Mar. Vol. 41. No. 3. pp. 381–385. With 2 text figs. & 2 figs. on 1 plate. [Bureau of Science, Manila, P.I.]

By the use of a special technique it has been possible to infect normal Aëdes mosquitoes by feeding them on a mixture of macerated dengue-infected *A. aegypti* and normal blood. The mixture was placed underneath a taut membrane formed by the skin of an exsanguinated guineapig. The whole was warmed and placed in the cage with the normal mosquitoes; these insects fed readily. Later the same mosquitoes were fed on volunteers and produced in them typical attacks of dengue. Citrated blood of dengue cases used in the same way also produced infection in mosquitoes. The authors suggest that their

method of infecting mosquitoes may be usefully employed in other diseases and for the preservation of virus. [A similar method of infecting tsetse flies was employed many years ago.]

D. H.

MILLOUS (Pierre). Note sur les caractéristiques cliniques d'une épidémie de dengue en 1927 dans une province de Cochinchine. [**Clinical Characters of a Dengue Epidemic in Cochin China.**]—*Ann. de Méd. et de Pharm. Colon.* 1929. July–Aug.–Sept. Vol. 27. No. 3. pp. 422–435. [1 ref.]

This is a very interesting and careful report of a sudden epidemic of dengue in the year 1927. The author in the course of his practice saw no fewer than 1,000 classical cases. The main points of this thesis are that this sudden and explosive epidemic was a new thing in that part of the world, and that there had been no such outbreak for at least 20 years. Although seven-day fever and "fever of the ports" are always to be met with, the author maintains that these are separate and distinct diseases and easily distinguished clinically from dengue. He cites three main points of difference: Dengue is a disease of two rashes, seven-day fever of only one; dengue produces most violent and severe bone and joint pains, much more severe than in seven-day fever; and the temperature curve of dengue is most irregular, whereas the curve in the two other diseases is a regular one.

Other special points noted were that people who carefully protected themselves by mosquito nets at night and by clothing in the day time were just as liable to contract the disease as those who did not so protect themselves, and the epidemic of dengue began before mosquitoes were prevalent and before the malarial season commenced, and ceased earlier. Cases were not more numerous in the country where mosquitoes abounded than in the towns where there were few.

[It is not stated whether the author is discriminating between the different species of mosquito.]

There follows a full and very elaborate clinical description of the disease derived from a close study of 1,000 cases. There were no cases at all in the following year, although conditions remained as before.

D. H.

POGGI (Igino). La dengue, con speciale riguardo all'epidemia estivo-autunnale sviluppatasi in Rodi nel 1928. [**The Epidemic of Dengue in Rhodes in 1928.**]—*Arch. Ital. Sci. Med. Colon.* 1929. Oct. 1. Vol. 10. No. 10. pp. 480–499. With 1 text fig. English summary p. 500. [Inst. of Trop. Path., Univ., Bologna.]

This paper gives a very full account of an epidemic of mild dengue in the Island of Rhodes, which occurred in the summer and autumn of 1928. The author is convinced that infection had been introduced from outside, probably Athens. He relates the clinical and statistical data and is convinced that by rigid prophylaxis (protection of sick and healthy, destruction of mosquitoes, etc.), it is possible to limit and even to check altogether an epidemic of dengue. In addition to such measures he recommends the destruction of all ectoparasites (lice, fleas, etc.), as it is possible that these insects may convey the disease direct from the sick to the healthy.

D. H.

ARAVANTINOS (John). **Hospital Observations on Dengue Fever. The Effect on the Kidneys.**—*Jl. Trop. Med. & Hyg.* 1930. Feb. 15. Vol. 33. No. 4. pp. 55–56. [Milit. Path. Hosp., Athens.]

Aravantinos noted that traces of albumin were present in the early stages of the disease in at least 60 per cent. of his patients, and often continued long after the fever ceased. Albuminuria with casts was noted in 30 per cent. of cases and usually indicated an aggravation of a chronic kidney trouble, and in a few cases acute Bright's disease with swelling of the legs was seen. In anyone who is already suffering from kidney trouble the disease is much aggravated by an attack of dengue and the kidney pain may be extreme. Treatment of such cases consists in rest in bed with milk diet and vegetable soup, with exhibition of theobromine and atropine.

D. H.

KLIGLER (I. J.). **Recent Studies on Dengue Fever.**—*Rev. Prat. Malad. des Pays Chauds.* 1929. Nov. Year 8. Vol. 9. No. 11. pp. 497–500, 503–504. [13 refs.] [Hyg. Dept., Hebrew Univ., Jerusalem.]

A résumé of recent work on dengue fever ; the subject is discussed under the following headings : epidemiology, etiology, symptomatology, immunity, transmission to animals, and prevention.

D. H.

PETROV (V. P.). **The Epidemiology of Sand-Fly Fever in Connection with the Biology of Sand-Flies.**—*Pensée Méd. d' Usbéquistane et de Turqumenistane.* Tashkent. 1929. Oct. No. 1. pp. 11–24. With 5 text figs. [94 refs.] [In Russian. English summary p. 102.]

Sandfly fever is known to occur in U.S.S.R., in the Crimea, in the Transcaucasus and in Central Asia ; and so long ago as 1878 it had been noted in Turkestan. The author witnessed two epidemics of this disease in 1926 and 1927 in Tashkent. Unfavourable meteorological conditions in 1928 affected the breeding of sandflies in that year and prevented a recurrence. The first cases in Tashkent are usually noticed towards the end of May or beginning of June and three weeks after the appearance of sandflies. Usually the insects vanish with the first cold days in the autumn and sandfly fever also ceases.

D. H.

MEDULLA (Candido). Sopra alcuni casi di febbri a tipo dengue ed a tipo pappataci osservati in Bengasi nel '29. (Nota epidemiologica e clinica.)—*Arch. Ital. Sci. Med. Colon.* 1930. Mar. 1. Vol. 11. No. 3. pp. 162–167. [19 refs.] English summary (8 lines) p. 168. [Colonial Hosp., Bengasi.]

SACORRAFOS. Les dites formes cliniques de la dengue.—*Rev. Méd. et Hyg. Trop.* 1929. Nov.–Dec. Vol. 21. No. 6. pp. 172–177. [2 refs.]

UNCLASSED FEVERS.

GARNAUDIER & FRÈZE. Sur quelques cas de fièvre exanthématique méditerranéenne. [**Cases of Mediterranean Eruptive Fever.**]—*Rev. Méd. de France et des Colonies.* 1929. Oct. Vol. 6. No. 10. pp. 511–515. With 1 chart in text.

The authors point out that since this disease is no longer confined to the Marseilles area, the interest in it is much more widespread, and therefore they publish these detailed notes of five cases observed by them in Roquebrune-sur-Argens.

Case No. 1 was that of a baby aged 11 months, which had fever and a profuse maculo-papular rash typical of the disease. The mother stated that a few days before the disease commenced she had removed a tick from behind the child's ear; later on a small eschar was noted at this spot. There were no digestive symptoms and no lung symptoms.

In case No. 2 there was a history of a bite by a "flying insect" about eight days before the fever commenced; a very marked "tache noire" developed at the site of the bite, with inflammation of the lymphatics and glands draining the area.

In case No. 3 there was no history of an insect bite, but a marked primary ulcer was seen on the leg.

Case No. 4 also gave a history of a bite by a "flying insect" about eight days before the disease commenced, but no "tache noire" could be found.

Case No. 5 showed a very painful boil on the leg attributed to a prick from a thorn; a general rash appeared a few days later with a typical attack of fever.

Summarizing these cases, the authors remark that the disease, although the patients may have high fever, is a benign one and the general condition remains good. Two of the patients were tuberculous, but there was no aggravation of this infection. The authors are convinced that the disease is due to tick bite, although, on this point, the history of their own cases is contradictory.

D. Harvey.

BÉROS (G.) & BALOZET (L.). Fièvre exanthématique d'été au Maroc. [**Summer Eruptive Fever in Morocco.**]—*Bull. Soc. Path. Exot.* 1929. Oct. 9. Vol. 22. No. 8. pp. 712–728. [Refs. in footnotes.]

The authors observed in Casablanca a malady which presented the following characters:—

An initial small ulcer or tache noire following, as a rule, the bite of a tick. A maculo-papular rash which appeared from the 3rd to the 6th day. A temperature curve resembling that of typhus and terminating in recovery usually in 2 to 3 weeks.

The disease occurs in the warm season and was most common on the outskirts of the town in places where cattle were grazed and ticks were common. No lice were observed on any of the patients or their contacts and there was no evidence of case to case infection. The Weil-Felix reaction was negative. Inoculation of the blood of patients into guineapigs was also negative.

This picture enables the authors to conclude that the disease observed by them was identical with the exanthematous fever of

Marseilles and fièvre boutonneuse of Tunis. They are also inclined to agree with BURNET and DURAND that this fever is not confined to the Mediterranean littoral and they suggest an analogy between this and the tick fever of South Africa described by SANT'ANNA and NUTTALL in Mozambique in 1911.

D. Harvey.

i. RAMSINE (S.). Sur l'existence de la forme inapparente du typhus exanthématique chez l'homme. [**Non-Apparent Form of Typhus in Man.**]—*Arch. Inst. Pasteur de Tunis.* 1929. Nov. Vol. 18. No. 3 & 4. pp. 247–254. With 2 charts. [3 refs.] [Central Inst. of Hyg., Belgrade.]

ii. NICOLLE (Charles). A propos du mémoire de S. Ramsine sur l'existence du typhus inapparent chez l'homme. [**Comments on Ramsine's Paper.**]—*Ibid.* pp. 255–257. [Summary appears also in *Bulletin of Hygiene.*]

i. The experiments of NICOLLE and LEBAILLY have shown the possibility of an acute disease running its course with the presence of the virus in the cells and tissues of the diseased organism in the absence of any clinical symptom.

Patients without any symptoms may therefore act as reservoirs of the virus and be the source of fresh infections.

During an epidemic of typhus in a colony of workmen living just outside Belgrade, 13 out of 97 healthy persons gave a positive Weil-Felix reaction with the following titres: 1 in 800 (1), 1 in 400 (1), 1 in 200 (6), 1 in 100 (5). With one exception none had had a previous attack of typhus and all remained healthy without showing the slightest rise of temperature. Inoculation of their blood into guineapigs produced typical experimental typhus.

ii. Nicolle emphasizes the importance of Ramsine's paper in which the first description is given of non-apparent typhus in man, his own observations having been confined to its occurrence in the guineapig.

In view of the difficulty in detecting these cases of inapparent typhus, except by laboratory methods, all persons in an active epidemic focus should be regarded as capable of spreading the disease without showing any evidence of it themselves. The same prophylactic measures therefore should be applied to them as to those actually suffering from the disease.

J. D. Rolleston.

MACARTHUR (W. P.), DUDLEY (S. F.) & WHITTINGHAM (H. E.). Tropical Fevers of Short Duration. With Conclusions by GERARDS (J. C.).—*Jl. Roy. Nav. Med. Serv.* 1930. Apr. Vol. 16. No. 2. pp. 113–119.

CARRION'S DISEASE.

MULLER (Henry R.) & TYLER (Joseph R.). **The Effect of the X-Ray on the Nodules of Verruga Peruana.**—*Jl. Experim. Med.* 1930. Jan. 1. Vol. 51. No. 1. pp. 23–26. With 6 figs. on 1 plate. [Rockefeller Inst. for Med. Research, New York.]

The curative influence of X-rays on various skin lesions in man suggested experiments to ascertain whether the rays applied therapeutically would affect the evolution of verruga nodules in monkeys. This supposition proved to be correct. Experiments showed that the early verruga nodules, when exposed to a single properly graduated dose of X-rays producing merely erythema of the skin, are inhibited in their evolution. Moreover, the skin of the monkey is modified by a single dose of X-rays in such a way that infection of it with *B. bacilliformis* is rendered more difficult. The authors consider that these results justify a trial of X-rays in suitably guarded doses in the treatment of verruga nodules in man.

D. Harvey.

ALDANA (Luis). Bacteriologia de la enfermedad de Carrión. [**Bacteriology of Carrion's Disease.**]—*Cronica Méd.* Lima. 1929. Aug. Vol. 46. No. 794. pp. 235–285. With 11 plates (9 coloured). [3 pages of refs.]

This issue of *La Cronica Medica* is designated a "monographic number," and is given up entirely to Dr. Aldana's thesis. He controverts many points now embodied as authoritative in the text-books, and his views will doubtless be tested by other observers with the probable result of giving a firmer foundation to our knowledge of the disease. The author's conclusions, epitomizing his views and the results of his experimental work, are as follows :

1. The causal agent of verruga peruviana is a bacterium, *Bartonella bacilliformis*, a non-motile organism, growing in liquid and on solid media containing whole blood, plasma, or serum, and remaining alive, without any special precautions, for nine months.

2. Haemoculture succeeds in both the "anaemic" and the "eruptive" phases of the disease and for a long time after the verruga rash has disappeared; in other words, throughout the whole clinical course, and the bacillus maintains its morphological and cultural characteristics.

3. From the bacterial aspect the "anaemic phase" may be divided into four stages : (*a*) invasion ; (*b*) fastigium, during both of which there is intense blood-destruction ; this is not due to haemolysis but to a toxin formed by the bacilli, the corpuscles being phagocyted by the reticulo-endothelial cells of the vessels and organs ; (*c*) decline which marks the end of blood-destruction ; and (*d*) regeneration of blood.

4. The bacillus multiplies in kidneys, lymphatic glands, liver, spleen, bone-marrow and skin, and in this order of intensity. During the eruption they are to be found in the verruga nodules.

5. The bacillus is not intracorpuscular, as is generally believed; it merely adheres to the exterior ; those apparently within the red cells are thought to be so from bursting of the endothelial cells when smears are made.

6. Experimentally, inoculation of the bacilli results only in producing the eruptive stages, not the anaemia or Oroya fever stage. Inoculation was tried in dogs, monkeys, rabbits, guineapigs and fowls, by all routes, subcutaneous, intravenous, intraperitoneal, intratesticular and sub-conjunctival.

The coloured plates of the organisms in the blood and tissue endothelial cells are well reproduced ; the photographs of the experimental lesions in animals are less successful.

H. Harold Scott.

MISCELLANEOUS.

KLEINE (F. K.) & KROÓ (H.). Antitoxine im Blut von Eingeborenen in Ostafrika. [**Antitoxin in the Blood of Native-Born East Africans.**]—*Deut. Med. Woch.* 1930. Jan. 10. Vol. 56. No. 2. p. 46. [Robert Koch Inst., Berlin.] [Summary appears also in *Bulletin of Hygiene.*]

The authors have tested 101 East African natives by the Schick reaction; 95 of these were children between the ages of 6 and 15, 6 were adults. In no case was a positive reaction obtained. The toxin employed was subsequently tested and found to have lost none of its activity. Specimens of blood were obtained from 11 of these natives and tested for antitoxin. Two sera contained more than one unit per cc., one serum contained one unit, two 0·5 unit, two 0·1, and three 0·05. It is clear, therefore, that the negative reactions were not due to any absence of reactivity in the skin of the natives, nor to any difficulty in reading the reaction, but resulted from the presence of circulating antitoxin. We have, apparently, another example of antitoxic immunity among a population which is not, so far as is known, exposed to infection with diphtheria. The same specimens of sera were tested for scarlatinal antitoxin by the Schultz-Charlton reaction. They gave a well-marked blanching. Such findings as these, as the authors point out, raise problems of the greatest importance for epidemiology and immunity; and it is clearly desirable that intensive studies should be carried out among different native races. [Such studies should include a very careful search for the diphtheria bacillus, or for toxigenic strains of haemolytic streptococci, among any populations found to possess the corresponding antitoxins.]

W. W. C. Topley.

D'HERELLE (F.). **Bacteriophagy and Bacteriophage.**—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 2. pp. 278–283.

——, MALONE (R. H.) & LAHIRY (M. N.). **The Pathology and Epidemiology of Infectious Diseases of the Intestinal Tract and of Cholera in Particular. I.**—*Ibid.* pp. 284–287.

——, —— & ——. **The Treatment and Prophylaxis of Infectious Diseases of the Intestinal Tract and of Cholera in Particular. II.**—*Ibid.* pp. 288–293.

MORISON (J.) & MARTIN (C. de C.). **The Therapeutic Use of Bacteriophage in Dysentery in Rangoon.**—*Ibid.* pp. 294–300. [Pasteur Inst. of Burma, Rangoon.]

In these four papers the whole subject of bacteriophagy, the nature of the bacteriophage, the bearing of bacteriophagy upon immunity to intestinal disease, the epidemiological significance of the bacteriophage and treatment by bacteriophage are touched upon in an extremely interesting way. The first paper is, very appropriately, a closely reasoned argument by d'Herelle himself on the nature of the bacteriophage principle. The subject is very intimately bound up with that of the nature of ultraviruses, with that of bacterial mutation, bacterial symbiosis and indeed with that of the nature of life itself as

defined by its manifestations. D'Herelle strongly maintains, and with a wealth of powerful arguments, that the bacteriophage is a living organism. It exists in the liquids which contain it in a granular phase and the size of its particles is equal to that of a micella of serum globulin, with diameter calculated at 20 to 35 millimicrons. Reproduction takes place only in the presence of and at the expense of living bacteria, and this fact allows of only two possible hypotheses as regards its nature, either that it is an enzyme derived from the bacterium or that it is a living autonomous being which utilizes bacterial substance in order to reproduce. A continuing symbiosis, moreover, can take place between bacteriophage and bacteria which have acquired resistance. Such a symbiosis can take place between other organisms and the host to which they have originally been pathogenic, as, for example, between bovines of tropical regions and the deadly *Piroplasma bigeminum.*

The author concludes: "Autonomy, the power of assimilation and of adaptation together constitute the criterion of life; all beings which possess these characters, and the bacteriophage is one of them, are undoubtedly living. The bacteriophage, a living being, is therefore an ultra-virus parasitic on bacteria and provokes in them an extremely contagious infectious disease manifesting itself to us through the phenomenon of bacteriophagy."

In the next two papers d'Herelle and his co-workers set out some of the data which bear upon the pathology, epidemiology, treatment and prophylaxis of infectious diseases of the intestinal tract, more particularly of cholera, considered from the point of view of bacteriophagy.

When a cholera epidemic is in full swing villages may be divided into (1) those where no case of cholera previously existed, but in which non-agglutinable vibrios and bacteriophages virulent for agglutinable cholera vibrios can be isolated from the bodies of flies and from the village drinking water, villages which appear to be "immune" in an epidemic; (2) those in which it has not been possible to isolate bacteriophage virulent for cholera vibrios either from the bodies of flies or from well water. At the time of the occurrence of the first case in a village it is not possible to isolate bacteriophage, but after a number of days it becomes possible to do so, and with this the epidemic is finally brought to an end because "contamination" by bacteriophage has become generalized. The original absence of bacteriophage and its appearance on the scene may be regarded as a repetition in the village community of what occurs in the individual who is attacked in the course of an epidemic.

Recovery in infectious intestinal diseases is not a question of the acquirement of immunity, but of exaltation of the virulence of a bacteriophage in the intestine of the patient, whereby the destruction of the pathogenic germ is brought about. The symptoms of acute dysentery in a patient treated with 2 cc. of a culture of bacteriophage disappear in 6 to 24 hours. Cholera, which is essentially an acute disease, has been treated similarly with 3 successive doses of 2 cc. of bacteriophage and the dosage repeated if necessary on the following day. As controls the authors took the cases present in a village on the day of visit for purposes of treatment not accepting bacteriophage treatment, as well as the cases which had occurred on the day before treatment and the cases which occurred on the day after. There was a mortality of 60 per cent. among 240 controls and only 8½ per cent. among 70 treated cases. Cessation of cholera epidemics takes place

with diffusion of bacteriophage virulent for cholera from the stools of patients containing it. The benefit of the bacteriophage thus produced is broadcast through the agency chiefly of drinking water and flies. It would be quicker to supply ready-made bacteriophage and to add it either before or during an epidemic to the drinking water of the community. But it is very essential in estimating the results of a given procedure to obtain some idea of its *absolute* as well as its relative efficacy. If, for example, all the procedures adopted were in reality ineffective it would not be sufficient to compare them relatively with one another. "In the course of all the epidemics in India the existence of cholera in a greater or smaller number of villages is only known when the last case occurs and it does not seem that the morbidity, the mortality and the duration of the epidemic is sensibly different in those villages from what they are in villages where the usual prophylactic measures are applied. In all cases are not the progress and the cessation of the epidemic entirely governed by natural agents?" It is the express desire of the authors to see experiments carried out on a large scale to determine the relative and absolute value of prophylaxis in cholera by means of bacteriophage. One point stands out prominently as necessary in such experimentation, namely, that only highly virulent bacteriophage be used in treatment or in prophylaxis.

The fourth paper by Morison and Martin deals not with cholera, but with dysentery.

They conclude that (1) "Under the conditions of a controlled test, not in all respects satisfactory, treatment of bacillary dysentery by bacteriophage alone has been as effective as orthodox treatment given to control cases . . ." and that (2) "the course of and the mortality from dysentery among cases treated with bacteriophage are not worse than in cases receiving antidysenteric serum, salines or other treatment appropriate to the cases." If, however, the cases diagnosed as bacillary dysentery are taken as a class apart, then (3) "the results of treatment with bacteriophage appear to be definitely better than those with other treatments."

W. F. Harvey.

MORISON (J.) & VARDON (A. C.). **A Cholera and Dysentery Bacteriophage.**—*Indian Jl. Med. Res.* 1929. July. Vol. 17. No. 1. pp. 48–54. [3 refs.]

The medium of culture for bacteriophage is prepared as follows:

(1) Grind up together minced goat flesh 600 gm. and dried papain 75 gm. and add water slowly to make 3,600 cc.; (2) heat in a water bath with rise of 10° C. every hour till 80° C. is reached; (3) heat for 1 hr. at 80° C.; (4) raise to boiling point and add N-1 sod. hydroxide to give reaction pH 7·8; (5) allow to cool; (6) filter through thick cloth and filter paper; (7) autoclave 45 min. at 15 lb. pressure; (8) dilute this stock bouillon with 2 parts water.

The actual therapeutic bacteriophage, which was a combination of cholera and dysentery bacteriophages and included one which was active against both cholera and dysentery, was prepared by adding the whole washings of 18-hr. agar cultures of various strains of dysentery and of cholera to flasks containing 900 cc. of papain broth. Three loopfuls of the seed bacteriophage were added to each of the seven flasks used. After 6 hours' incubation at 37° C. lysis must be complete: the flasks are removed, shaken, left at room temperature overnight, mixed and filtered through Chamberland F candles under a vacuum

not exceeding 6 lb. Incubation tests for purity are applied both before and after distribution in ampoules, and the test of activity for the combined bacteriophage is that it must produce complete lysis in dilution of 1 in 10 million. Bacteriophage treatment has been applied in two epidemics of cholera and the combined statistics show 22 deaths out of 29 cases receiving no treatment and only 9 deaths out of 31 cases (including 4 moribund) receiving treatment.

W. F. Harvey.

SCHULTZ (E. W.). **The Bacteriophage as a Therapeutic Agent.**—*California & Western Med.* 1929. July. Vol. 31. No. 1. pp. 5–10. [55 refs.]

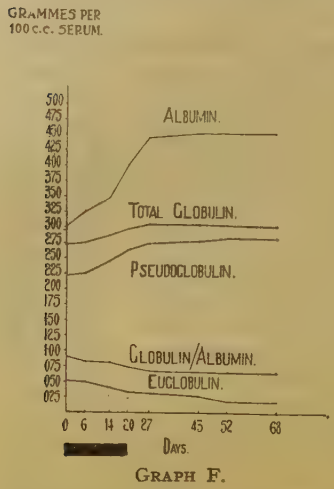
The author is a strong advocate for the therapeutic use of bacteriophages, but recognizes that certain factors may hinder or entirely prevent their curative effect. If all pathogenic bacteria were as uniformly susceptible to phage action as dysentery bacilli, the supply of suitable medicament would be a simple matter. But most pathogenic bacteria show strains with very varying susceptibility. Even a susceptible bacterium, if subjected to the action of a weak phage, may acquire resistant properties. This result is exemplified both *in vitro* and *in vivo*. Secondary resistant colonies appear in cultures which have undergone lysis, if the phage has been of insufficient virulence to sterilize completely. A balance between organism and phage may be established and the two come to coexist. The problem of therapy then, and it is not an easy one, is to find a phage of special virulence for the causal organism of a disease. Not only may different strains of specific organisms show very varying susceptibility to phage, but antibodies may be developed to the phage itself, which go to neutralize its solvent action. This may be seen especially in chronic urinary affections. Elimination of phage may play a part in failure of its action. For, while phage increases in concentration in the presence of bacteria, it is eliminated and will disappear if there are no organisms within its reach. Bacteriophage is only produced in the presence of organisms. The mode of administration of phage varies somewhat. In dysentery it is given by the mouth; in typhoid fever a combination of oral and subcutaneous administration may be followed; in colon infections of the urinary tract it is injected into the bladder or pelvis of the kidney after alkalinization of the urine, and subcutaneous injections are given in addition; in staphylococcus infections subcutaneous injection in the neighbourhood of the lesion is commonly used; wounds may be dressed with bacteriophage in addition to subcutaneous injection. The author finishes with the cautionary remarks that it may never be possible to justify commercial production of phage and that its usefulness at best may be restricted.

W. F. Harvey.

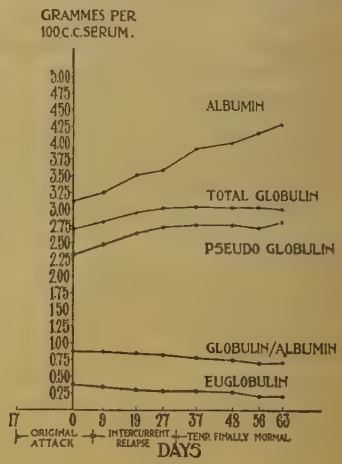
LLOYD (R. B.) & PAUL (S. N.). **Serum Protein Changes in Malaria and Typhoid Fever with Suggestions as to their Possible Bearing on Immunity.**—*Indian Jl. Med. Res.* 1929. Oct. Vol. 17. No. 2. pp. 583–610. With 14 graphs. [17 refs.]

Previous work by the authors on the changes which occur in the serum protein fractions of kala azar patients when treated by antimony compounds [see this *Bulletin*, Vol. 26, pp. 319 and 744] has led to their

investigation of the changes occurring with an attack of malaria and the effect of quinine. The changes which occur in true typhoid fever and after inoculation with T.A.B. vaccine have likewise been investigated. A number of graphs are given of malaria and typhoid cases, showing, for days of illness and treatment, the albumin, total globulin, pseudoglobulin and euglobulin in gm. per 100 cc. serum, together with the globulin-albumin ratio. Only a few of the graphs



GRAPH F.



GRAPH N.

Graph F relates to a patient with a long malarial history, whose blood, despite a prior 7 days' quinine course, contained malignant tertian rings on admission to hospital. After the first protein estimations had been made the patient was put on a 20 days' course of quinine.

Graph N relates to a typhoid fever patient whose illness had begun 17 days before the first protein estimations were made. On the 6th day of the graph the patient's temperature tended to become nearly normal, but subsequently rose and remained elevated up to the 31st day of the graph, providing a good example of the so-called "intercurrent relapse." It will be noted that the rise in the albumin began at about the same time as, and was not affected by, this intercurrent relapse, nor did the latter prevent the progressive fall of the euglobulin to normal.

[Reproduced from *Indian Journal of Medical Research.*]

prepared are illustrated here, and the remarkable fact is noted that there was no departure, even in a single case, from the typical features. In a typical case of malaria, before quinine administration has begun, it is found that there is a low total of serum protein, due almost entirely to reduction in the albumin. There may be reduction in the total globulin, but it is often slight and may be absent. The euglobulin is always raised, usually to about double the normal figure, and the pseudoglobulin is correspondingly reduced; but the sum of these two figures is not a constant. In no case did the globulin-albumin ratio exceed unity. With the initiation of quinine treatment (20 grains of sulphate in solution daily) the return of the protein fractions to normal is very rapid, and this is particularly well shown by the steepness of the gradient in the albumin curve. A very similar set of changes is observed in the case of typhoid fever, and graphs are given exhibiting

these changes throughout the whole of an attack in uninoculated persons, including relapses if they occurred. In typhoid fever, in marked contrast to malaria, the rise of the albumin to normality is gradual, not sudden. The authors think that this may be due to the fact that no specific drug exists for the treatment of typhoid. Inoculation of human beings with T.A.B. vaccine also gives rise to the characteristic changes in the serum, with the one difference of a raised total globulin figure: the changes are of less degree. It is rather extraordinary, and somewhat of an enigma, to find that in cases of typhoid associated with relapse the return of serum protein to normal amounts and relations is not affected: the return commences with the first defervescence, but does not reach actual normality until long after the temperature curve has touched normal.

The authors consider that, although malaria and typhoid fever are very unlike each other, these protein graphs suggest that it is the use of the specific drug in malaria which gives rise to serum protein response similar to that which a slow and gradual immunization produces in typhoid. They adduce evidence for the hypothesis that "in typhoid fever the period of low albumin and raised euglobulin represents the stage of immunization and that, only after immunization is complete, does the return to protein normality commence."

W. F. Harvey.

BANNERJEE (K.). **The Streptococci and their Importance in the Treatment of Tropical Diseases.**—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 2. pp. 457–464. [1 ref.]

The rôle of the streptococci as primary disease agents and as causes of secondary infections is coming to be more and more recognized. In the tropics affections such as rheumatic fever, scarlet fever and purpura, which are generally regarded as of primary streptococcal causation, are rare. This may be related to the fact that the normal oral and nasopharyngeal flora in the tropics differs markedly from that of temperate regions. On the other hand, the incidence of empyema and puerperal septicaemia due to streptococci in Indian hospitals is very nearly the same as in temperate climates. An investigation has been carried out by the author into streptococcal manifestations affecting (1) the skin; (2) subcutaneous tissues; (3) the gastro-intestinal tract; and (4) the urinary tract. As primary cutaneous lesions, two varieties of impetigo have been met with, the superficial and the deep. Streptococci play a very important part as secondary infection of tineas and seborrhoeic dermatitis and make up nearly 60 per cent. of all skin diseases treated at the outdoor clinic. Most of the clinical manifestations of filariasis are in reality those due to streptococcal infection. As regards the gastro-intestinal tract, reference is made to the connexion between pyorrhoea alveolaris and multiple rheumatoid arthritis, while neuritic and joint pains may be due to infection of the larger nerve trunks and to septic emboli respectively, originating in a streptococcal subacute follicular tonsilitis. Gastric or duodenal ulcers and dysenteric ulcers, again, may be portals of entry of streptococci, with production of grave anaemia or of septic emboli in nerve trunks and joints. The intractability of amoebic ulcers may be due to secondary streptococcal infection. Evidence that many of the severe anaemias of unknown origin may be due to haemolytic strepto-

coccal infection is given by isolation of the organisms in the urine and the disappearance of symptoms under autovaccinetherapy. Some special animal experiments were done by perfusion of the kidney and showed that normal glomerular epithelium is impermeable to bacteria.

W. F. Harvey.

MORIN (Henry G. S.). Sur quelques cas de septicémie à entérocoque de Thiercelin. [**Enterococcus Septicaemia.**]—*Bull. Soc. Path. Exot.* 1929. Oct. 9. Vol. 22. No. 8. pp. 690–704. [78 refs.] [Pasteur Inst., Saigon.]

At Marseilles 100 positive haemocultures afforded 7 enterococci. At the Pasteur Institute, Saigon, 24 enterococcus isolations are recorded out of 486 positive haemocultures. With an organism so ubiquitous as the enterococcus, proofs have to be adduced confirming the first isolation ; such a proof would be constancy of finding of the organism in successive blood cultures. In France cases in which isolation of the organism has been successful have usually been moribund on arrival, while in Cochin China they are chiefly slight cases of gastric trouble. Neither type of case allows of opportunity for a second blood culture. Six cases, however, have afforded this proof, that is of the isolation of enterococcus on at least two successive occasions at an interval of not less than 24 hours. The clinical conditions were those of septicaemia with 5 deaths ; 4 cases had signs of malignant endocarditis. On one case, occurring in Cochin China, of long duration, with endocarditis, numerous haemocultures were performed over a period of 3 months. On 10 occasions culture was positive, 9 with enterococcus alone and once in association with *Bact. coli*. The organism was identified as the enterococcus of THIERCELIN (*Streptococcus faecalis*, or Micrococcus ovalis) by morphological and cultural characters, insolubility in bile, growth in bile media, carbohydrate reactions, non-reduction of lead subacetate, clotting of milk, thermoresistance, and low pathogenicity for laboratory animals. The types of affection associated with positive blood culture of enterococcus are (1) simple gastric indisposition with ephemeral appearance of the coccus in the blood and appearance in the urine ; (2) chronic malignant endocarditis with frequent appearance of the organism in the blood ; (3) blood infection with cachexia. There is nothing to distinguish the organisms isolated from the faecal cocci constantly present in the intestine.

W. F. Harvey.

i. GIGLIOLI (George). **Paratyphoid C. in British Guiana. Clinical and Epidemiological Notes.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Nov. 25. Vol. 23. No. 3. pp. 235–256. With 5 charts & 1 diagram.

ii. ——. **Paratyphoid C an Endemic Disease of British Guiana ; a Clinical and Pathological Outline.** *B. paratyphosum* **C as a Pyogenic Organism ; Case Reports.**—*Proc. Roy. Soc. Med.* 1929. Dec. Vol. 23. No. 2. pp. 165–177 (Sect. of Trop. Diseases & Parasit. pp. 1–13). With 4 charts & 2 figs. in text.

i. This article deals in a very comprehensive manner with the clinical and epidemiological manifestations of the disease produced

in man by *Bact. paratyphosum C*. The clinical study is based on 92 cases and these were cases in which the diagnosis received laboratory confirmation.

"Paratyphoid C is eminently a 'fever' and its temperature curve constitutes its most characteristic symptom." This curve, which is a daily remittent one, shows a very variable duration of from 5 to 40 days. Unlike the enteric and the other parenteric fevers, the intestinal tract is not specially involved. Complications occurred in the shape of arthritis, abscess and cholecystitis. The abscess cases are especially interesting. Only one was a spontaneous case. The rest occurred in the gluteal region at the site of intramuscular injections of quinine bihydrochloride. Pure cultures of *Bact. paratyphosum C* were obtained from these abscesses. Fifty-nine of the paratyphoid C cases, simple or complicated with malaria, received quinine by intramuscular injection. Other complications were of the nature of concomitant or secondary morbid conditions, such as malaria, boils, helminthic affections, etc. The prognosis of the disease is dependent upon the form it takes. Mortality in the 92 cases of confirmed paratyphoid C reached 38 per cent., but obviously this is a mortality rate applicable only to hospital cases. The great mass of abortive and mild cases pass unobserved. Race, age, and sex distributions of the disease in the series investigated were "in fair proportion to the various elements of the local population." Fifty-seven cases were in negroes. As regards mode of spread, milk and food generally are excluded; flies are not considered important, and carriers are thought to be the most likely means of distribution of the infection.

ii. All the strains of the organism isolated in British Guiana conformed exactly in character to what has been described as the eastern subtype of the suipestifer-paratyphosum group. The explanation of the presence of what is apparently a strictly eastern organism is tentatively ascribed to the large importation into British Guiana of coolies from India and China. A marked relation of the disease induced by *Bact. paratyphosum C* to malaria is emphasized, and the association amounted in the series of cases reviewed to 29 per cent. The purely septicaemic character of the disease is shown at autopsy, and in uncomplicated cases the bowel has appeared to be quite normal. Accidental occurrence of deep intramuscular suppuration at the site of intramuscular injections afforded a clue for the adoption of a mode of cutting short the septicaemia infection by formation of a fixation abscess. Quinine injections were used as the means of provoking such abscesses. In their evolution they were accompanied by little or no pain and were afebrile in 75 per cent. of the cases observed. They afforded pure cultures of *Bact. paratyphosum C*. The pus was not confined in a cavity, but distended the intermuscular spaces, to form large pockets. It was watery and of a dirty yellow green colour. No difficulty was found in dealing with the abscesses in spite of their infiltrating character, and they healed completely in 2 to 3 weeks. With the development of abscess there was invariably a marked improvement in the general condition of the patient. Thus *Bact. paratyphosum C* must be regarded as a pyogenic organism; its pyogenic activity is manifested usually in tissues whose resistance has been diminished by trauma or pre-existing disease, that is to say, in a *locus minoris resistentiae*.

W. F. Harvey.

ROMITI (C.). **Notes on an Unusual Case of Suppurative Cholecystitis from** *Bacillus paratyphosus* **C. Infection.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Nov. 25. Vol. 23. No. 3. pp. 257–262.

The case was one which showed on admission a heavy malarial infection and received quinine by the mouth and intramuscularly. As the fever was not influenced by the treatment, blood cultures were taken and *Bact. paratyphosum* C isolated. Temperature fell to normal on the 24th day. On the 34th day an abscess developed in the buttock region and *Bact. paratyphosum C* was grown in pure culture from the pus. Complications in this case were a *Staphylococcus aureus* abscess on the 16th day in the parotid region and the development of symptoms pointing to gall bladder infection from the 15th day. After the development of further symptoms, a diagnosis of suppurative cholecystitis was confirmed at operation and pure cultures of *Bact. paratyphosum C* were obtained from the pus. No gall stones were present and the post-operative course was excellent. The features of the case were : (1) the causation by *Bact. paratyphosum C* ; (2) the afebrile course and extreme mildness of all subjective and objective symptoms in spite of suppurative pericholecystitis ; (3) the spontaneous elimination of a necrotic gall bladder ; and (4) the absence of gall stones.

W. F. Harvey.

MESNARD (J.), JOYEUX (B.) & GAULENE. Un cas de mélioidose au Tonkin. [**A Case of Melioidosis in Tonkin.**]—*Bull. Soc. Méd. Chirurg. Indochine.* 1929. Jan. Vol. 7. No. 1. pp. 32–39. With 1 chart. [2 refs.] [Pasteur Inst. & Lanessan Hosp., Hanoi.]

Reports of the occurrence of melioidosis in human beings are still infrequent. The case referred to is only the third which is known to have occurred in a European and his infection was probably contracted in the usual way by ingestion of food contaminated with the dejecta of rats. In its onset the disease was sudden, with rigor, fever and lumbago. From the beginning the patient showed dulness of mind, although he could reply quite clearly to questions addressed to him. By the 4th day improvement set in, which continued for a time ; a papular rash was observed on the abdomen on this day. A return of symptoms, however, occurred ; pneumonia and coma supervened and the patient died on the 13th day. No malaria parasites were found in the blood and serum agglutination was negative for the typhoid group of bacilli. It was otherwise for *Proteus X*19. Although the agglutination was negative for the indole-positive *Proteus X*19, it was positive in a titre of 1 in 300 for the indole-negative *Proteus X*19 (with blood drawn on the 6th day of the disease). The suggestion raised by this result that the affection might be typhus was negatived by the injection of the patient's blood into two guineapigs ; no rise of temperature occurred. Blood culture, on the other hand, in peptone bouillon was positive after 2 days' incubation at 37°C., and the organism grown was identified morphologically, culturally and serologically as *Pf. whitmori*. The diagnosis of melioidosis appears to be perfectly justified in spite of the occurrence of a Weil-Felix reaction.

W. F. Harvey.

SCHWENTKER (Francis F.). **The Estimation of Hemoglobin. A New Hemoglobinometer.**—*Jl. Lab. & Clin. Med.* 1929. Dec. Vol. 15. No. 3. pp. 247–259. With 3 text figs. [2 pages of refs.] [Lab. of Physiol. Chem., Johns Hopkins Univ., Baltimore.]

It is probable that no clinical blood examination is quite so universally employed as the estimation of haemoglobin. The present article is

particularly interesting, not merely for the method advocated, but also for the review presented of existing methods.

1. *Direct Colour Comparison Method.* The names of GOWERS (1878), V. FLEISCHL, DUBOSC, TALLQUIST and DARE are among those associated with this method. "The Tallquist is probably the least reliable of the series . . ." and, "the Dare instrument has many times been shown to have an accuracy little greater than the Talquist. In fact, the general error of the instruments constructed on this principle has been shown . . . to range from 10 per cent. to 40 per cent."

2. *Acid Haematin Method.* The method, introduced by SAHLI (1895), consisted in the conversion of the haemoglobin of the blood to acid haematin and a comparison of the colour so obtained with a standard. But the colour of standard solutions fades rapidly and may even reach 50 per cent. in 18 months. Other standards of colour than the actual acid haematin have been employed. Some of these also fade, some are difficult to match, and some are susceptible to variations in temperature. One great disadvantage of the method is the delay in the formation of the maximum colour of the acid haematin, and a period of 40 minutes must elapse before reading, if even an intrinsic accuracy of 1 per cent. is to be obtained. Differences of 1 mm. in the tubes used for comparison may result in errors of 25 to 33 per cent. A certain amount of reduction of the time to formation of maximum colour may be obtained by the application of heat, but cloudiness is produced by temperatures over 30° C. Careful estimations, however, against standards checked within a month may give results with errors not exceeding 5 to 7 per cent.

3. *The Carbon Monoxide Method.* The method proved too complicated for use until HALDANE (1900) adapted it for use with the Gowers colorimeter. The carbon monoxide is furnished from ordinary coal gas. Results accurate to 5 per cent. may with care be obtained if the standards are fresh.

4. *Iron Content Method.* With this method a rather high accuracy (1 per cent.) is obtainable, but it requires too much time and too much blood to be adopted in routine work.

5. *Oxygen Capacity Method.* Both experience and time are required to carry out the test, but in the newest instrument made (VAN SLYKE and MILL) results with maximum variation of 0·48 per cent. have been recorded.

6. *Specific Gravity Method.* The assumption on which this method was based, was that the haemoglobin content and the specific gravity of blood have a definite relation, but this has been proved to be incorrect.

7. *Spectroscopic Method.* The various methods depend on the comparison of the spectrum of diluted blood with a known haemoglobin solution. Instruments used in the estimation are usually large and expensive.

8. *Spectrophotometric, Refractometric and Extinctometer Methods.* These are not ordinarily used for clinical purposes.

The author's own method utilizes the principle that "if blood be diluted to a known volume and the depth of the fluid stratum varied until the spectrum caused by it assumes some predetermined picture, the concentration of the oxyhemoglobin in the solution will be inversely proportional to the known depth. Or,

$$c = A\frac{D}{d},$$

where c = the concentration of oxyhemoglobin in the blood (gm. per 100cc.) A = the absorption constant (determined experimentally), D = the dilution (cc.), d = the depth of the fluid stratum (cm.)." The constant A must obviously be first determined. Only a small quantity of blood (0·1 cc. and even 0·025 cc.), such as may easily be obtained from a prick of the finger, is required. It is claimed that even with bloods of low haemoglobin concentration the readings check within 0·7 per cent. A criticism might be

advanced that the method requires for its use the certainty that the test blood shall be totally saturated with oxygen. It has been found, however, that "enough oxygen is absorbed by the blood during its exposure on the finger tip and from the water with which it is diluted to cause no appreciable error in the results."

W. F. Harvey.

VAN WALSEM (G. C.). Over de reiniging van glaswerk, gebruikt bij het morphologisch bloedonderzoek, en over de vulling der telkamers met nauwkeurig bepaalde hoeveelheden. [**Cleaning of the Glassware used in Blood Examination and Filling of the Counting Chamber with Accurate Fixed Quantities.**]—*Nederl. Tijdschr. v. Geneesk.* 1929. July 13. Year 73. 2nd Half. No. 28. pp. 3258–3260. With 5 figs. (1 on plate).

The technique of the blood count is a highly important one because it is so widely used. The cleansing fluid for pipettes and chamber has the composition, 10 per cent. sod. hydroxide 2 cc. with 2 drops of bromine. Traces of blood develop gas (nitrogen) in contact with this fluid, whereby cleansing is facilitated. The glass pipettes should be filled with fluid and left for 10 minutes. They are washed through with water, alcohol and ether in the usual way. Stress is laid on the use of a definite quantity of blood-reagent mixture in the counting chamber and it is obtained as follows: (1) Two drops are rejected from the filled pipette; (2) 2 more drops are then placed in a watch glass; (3) an air bubble, occupying one subdivision, is sucked up into the pipette; (4) 4 subdivisions of mixture from the watch glass are taken up into the stem of the pipette. The operation has to be quickly performed to avoid sinking of corpuscles. These 4 subdivisions of blood mixture are put out upon the central plate and, in the instrument used, occupied the entire plate and a portion of the trough around it. Corpuscles are not absolutely uniformly distributed over the whole central plate surface, for there is a narrow rim at the periphery which has fewer corpuscles per unit of area than the centre, but the error is constant and negligible. It is not remedied, but rather aggravated, by taking an amount of mixture less than the exact 4 subdivisions of the pipette. With this technique erythrocytes, leucocytes and blood platelets stand out distinct from one another and can be counted.

W. F. Harvey.

CHOPRA (R. N.) & GHOSH (Sudhamoy). **Observations on Certain Medicinal Plants used in the Indigenous Medicine.**—*Indian Jl. Med. Res.* 1929. Oct. Vol. 17. No. 2. pp. 377–384. [2 refs.] [School of Trop. Med. & Hyg., Calcutta.]

The following plants, well known in Indian medicine, were examined: *Tribulus terrestris* Linn. (N.O. Zygophyllaceae). An extract prepared from the seeds was tried clinically and was found to be diuretic, but to have no advantage over similar drugs of the British Pharmacopoeia.

Pistacia integerrima (N.O. Anacardiaceae). The drug is prepared from galls on the surface of the leaves. This was found to be expectorant, but to be much overrated.

Caesalpinia bonducella Fleming (N.O. Leguminosae). As the chemical examination of the seeds did not reveal active principles with marked pharmacological action no clinical trials were made.

Abroma augusta Linn. (N.O. Sterculiaceae). In the absence of signs of physiological activity of the roots no clinical trials were made.

A. G. B.

CHOPRA (R. N.) & DE (Premankur). *Saussurea lappa* (**Kut Root**) **in Pharmacology and Therapeutics.**—*Indian Jl. Med. Res.* 1929. Oct. Vol. 17. No. 2. pp. 351–359. With 2 plates. [7 refs.] [Calcutta School of Trop. Med. & Hyg., Calcutta.]

Saussurea lappa, a Compositaceous herb with annual stem and perennial roots, grows on the slopes of the Himalayas and the root is so greatly esteemed in India that the market price in Calcutta is about seven shillings per pound. It is used for various symptoms, especially asthma. It is exported to China in large quantities to be used as incense, spice and medicine.

The root was found to contain an essential oil 1·5 per cent., an alkaloid, saussurine, 0·05 per cent., and resin 6·0 per cent. The drug in the form of an alcoholic extract of the root has a remarkable effect, exercised jointly by the essential oil and the alkaloid, in controlling attacks of bronchial asthma, especially those of the vagotonic type. It is useful also in persistent hiccough, but has no action in malaria, leprosy or rheumatism, or against helminths.

A. G. B.

MINOT (A. S.) & CUTLER (J. T.). **Guanidine Retention and Calcium Reserve as Antagonistic Factors in Carbon Tetrachloride and Chloroform Poisoning.**—*Jl. Clin. Investigations.* 1928–29. Vol. 6. pp. 369–402. With 2 charts in text. [43 refs.] [Med. School, Vanderbilt Univ., Nashville.]

Minot in 1927 lost most of his carbon tetrachloride treated dogs owing, as he ascertained, to the calcium-deficient diet on which they were kept (lean meat without bones), and showed that after addition of calcium salts they were tolerant of the drug: cases of intoxication could be cured by calcium therapy (this *Bulletin*, Vol. 25, pp. 417, 469). Here further studies are described at length with the following conclusions:—

"2. The outstanding features of the intoxication [of dogs on a calcium-low meat diet fed carbon tetrachloride] are gastro-intestinal irritation, nervous hyperexcitability usually followed by depression, bilirubinemia, a retention of guanidine in the blood and hypoglycemia. Pathological studies show a severe central necrosis of the liver.

"3. A similar but more severe toxic picture is presented in chloroform poisoning or when alcohol is given with carbon tetrachloride.

"4. A causal relationship between the retained guanidine in these intoxications and the symptoms noted is indicated by the fact that the maintenance of similar concentrations of guanidine in the blood of a normal dog by the administration of guanidine hydrochloride produces an intoxication in which there is close similarity to carbon tetrachloride poisoning both in the quality and severity of symptoms produced. Calcium also has a highly beneficial action in guanidine poisoning.

"5. The basis for the relief and protection afforded by calcium in carbon tetrachloride poisoning seems to lie in its antagonistic effect to the retained guanidine . . .

"6. At least three factors contribute to the acute need for calcium in carbon tetrachloride poisoning, (*a*) the deficient calcium intake, (*b*) the need for extra calcium to combat the effects of guanidine, and (*c*) the reduction of ionized calcium in the blood by combination with retained bile pigments.

"7. Practical suggestions for the safe use of carbon tetrachloride would emphasize the importance of a liberal calcium diet and the avoidance of meat which tends to increase guanidine retention."

"A bread and milk diet is an easy method of furnishing both calcium and carbohydrate in adequate amounts. With these precautions cases of intoxication should be extremely rare. If poisoning should occur, a combination of calcium chloride and dextrose therapy seems indicated and in our experience has nearly always proved effective."

A. G. B.

BOYD (T. C.) & ROY (A. C.). **Observations on the Excretion of Antimony in the Urine.**—*Indian Jl. Med. Res.* 1929. July. Vol. 17. No. 1. pp. 94–108. With 19 charts & 1 text fig. [5 refs.]

It appeared to the authors to be of practical importance to study the excretion of antimony, both pentavalent and trivalent, in kala azar. No. 693, a diethylamine salt of p-aminophenyl stibinic acid, was chosen as a type of a pentavalent antimony compound and sod. ant. tart. as a trivalent compound. Much of the paper is occupied with a description of the method employed for antimony estimation in the presence of organic matter. The following are among the conclusions reached :—

"(2) We have studied in detail the excretion rate of a pentavalent compound (i.e., No. 693), when given intravenously and found that on an average about 41 per cent. of the antimony is excreted in the first twenty-four hours, 6 per cent. in the second, and about 1 per cent. in the third twenty-four hours.

"(3) We have shown that when the same compound (No. 693) is given intramuscularly about 34 per cent. of the antimony is excreted in the first twenty-four hours, 3 per cent. in the second, and 1·5 per cent. in the third twenty-four hours.

"(4) The types of curves obtained under both intravenous and intramuscular injections are similar except that there is a slight lag in the excretory rate when the intramuscular route is used.

"(6) The excretion rate of a trivalent antimony compound (i.e., sodium antimony tartrate) is extremely low when compared with No. 693 and is characterized by a gradual fall."

The injections were given to two patients in each instance.

A. G. B.

SHATTUCK (George C.). **Further Use of Antimony Thioglycollamide in Bilharziasis and in Trypanosomiasis.**—*Jl. Trop. Med. & Hyg.* 1930. Feb. 1. Vol. 33. No. 3. pp. 33–34. [5 refs.] [Harvard School of Public Health, Boston.]

In 1926 the author published an account of 3 cases of granuloma inguinale treated with sodium antimony thioglycollate and triamide of antimony thioglycollic acid [see this *Bulletin*, Vol. 24, p. 315]. An account is here given of a few cases of schistosomiasis and trypanosomiasis treated by CHESTERMAN and TODD in Belgian Congo.

In the 14 cases of schistosomiasis, which are tabulated, prompt relief was given with doses that were small both individually and in total: adequate follow up was not possible, but some patients appeared to be well five months or more after the treatment. In the six cases of trypanosomiasis the results appear to have been less favourable. It is stated that CHESTERMAN is sceptical of the value of antimony thioglycollamide. [The paper seems to be incomplete, for the "summary" contains much that is not found elsewhere.]

A. G. B.

STOCKMAN (Ralph). **Lathyrism.**—*Jl. Pharm. & Experim. Therap.* 1929. Sept. Vol. 37. No. 1. pp. 43–53. [9 refs.] [Univ., Glasgow.]

Dr. Stockman's paper adds little to our knowledge of lathyrism. He describes the work of ACTON and of ACTON & CHOPRA (this *Bulletin*, Vol. 20, pp. 46 and 645) who found the active principle of this pea to be an amine which caused the characteristic symptoms in experimental animals. The work of ANDERSON, HOWARD & SIMONSEN (*l.c.*, Vol. 22, p. 985) is criticized; in their experiments *Lathyrus sativus* was harmless and they believed the symptoms to be due to contaminating seeds of a vetch (acta). Stockman points out that lathyrus poisoning has long been well known in man and animals in countries wide apart, in many of which it is cultivated without appreciable admixture of other seeds, so that the results of these workers cannot be the whole story. He has repeated some of his former experiments, feeding four monkeys on lathyrus peas bought in Glasgow and describes the symptoms produced in two of the animals. [In the absence of satisfactory evidence that the diet contained essential vitamins the value of the experiments seems doubtful.] Other feeding experiments were made on rabbits and guineapigs. The author finds that the poisonous active principle can be more or less fully extracted from the ground peas by cold water, acidified water, weak and 90 per cent. alcohol and by chloroform and when highly purified proves to be very toxic when tested on monkeys and frogs.

A. G. B.

COWAN (J. M.). **Cinchona in the Empire. Progress and Prospects of its Cultivation.**—*Empire Forestry Jl.* 1929. Vol. 8. No. 1. pp. 45–53. With 2 plates.

The author points out that within the Empire India is the only country where cinchona is cultivated on a large scale. After its introduction, between 1854 and 1864, private planters took up the cultivation but by 1890 there was over-production, and cinchona gave place to tea, so that the cinchona plantations are now owned and managed by Government. However, the production is small relative to Java, 4 per cent. as against 90 per cent., and the quantity produced in India represents only about one-third of that actually consumed in the country; were India to be in a position to provide what is estimated as the minimum of her requirements, the production would have to be

multiplied 18 times. Not only are supplies insufficient, but the price is too high. Three species of cinchona are cultivated with the percentage of quinine and other alkaloids set forth :—

	Quinine.	Other alkaloids.	Total alkaloids.
C. Ledgeriana ...	5·49	3·03	8·52
C. officinalis ...	2·93	2·07	5·00
C. succirubra ...	1·40	4·85	6·25

It is seen that *C. ledgeriana* is richest in quinine and in total alkaloids, and *C. succirubra* in "other alkaloids." The author discusses the cultivation of cinchona and especially *ledgeriana*. All three are fastidious in their requirements. There are untried areas in India, Malaya and Tanganyika where conditions would seem to suit. Harvesting of the bark begins in a block in the fourth year, and the block is uprooted about the tenth year, when the bark is completely stripped from root, stem and branch. He thinks there is scope for investigation as to particular strains which yield high percentages of quinine. [Whether cinchona should be grown for its yield of quinine or of other alkaloids is not yet settled.]

A. G. B.

MEGAW (J. W. D.) & HAWLEY (Herbert). **Simple Tests for Stock Solutions of Quinine and Potassium Iodide.**—*Indian Med. Gaz.* 1929. July. Vol. 64. No. 7. pp. 378–380. With 3 text figs.

Reference is made to an earlier paper by the senior author and others [this *Bulletin*, Vol. 26, p. 23]. Recently, many samples of stock mixtures of quinine have been tested in the Punjab and Madras. Thus, at the Headquarters Dispensary, Madras Presidency, solutions of stated strength 10 grains were found actually to contain 1·6, 3·1, 7·2, 7·2, 5·4 and 3·9 grains. In 5 other dispensaries the strength of the same stock solution varied between nil and 6·8 grains (excepting one instance in which it was 12·2). "Many of the medical officers were astounded at the results of the tests." They throw a flood of light on the supposed failure of quinine when given by the mouth and "it is safe to say that cases of quinine-resistant malaria are usually cases of compounder-resistant malaria." Details of the test are given and sketches of the apparatus. As a rule, the defect does not lie in the powder, but in the preparation of the mixture. The Pot. Iod. solutions were usually up to strength.

A. G. B.

WATS (R. C.). **A Simple Method for Estimation of Quinine Salts in Stock Solutions.**—*Jl. Roy. Army Med. Corps.* 1929. Dec. Vol. 53. No. 6. pp. 445–447. [2 refs.]

The author refers to MEGAW's papers on the quinine content of mixtures used in civil hospitals in India [see above]. He recommends a method of estimation of quinine salts which "can be carried out . . . just as easily as a milk-fat estimation." For details the journal must be consulted.

A. G. B.

VIALATTE (E. F. C.) & REMONTET (J. E.). Un cas de purpura provoqué par la quinine. [**Case of Purpura provoked by Quinine.**]—*Arch. Méd. et Pharm. Milit.* 1929. Oct. Vol. 91. No. 3. pp. 345–349. [1 ref.]

In spite of a considerable experience of North Africa, where the troops take quinine for half the year, the authors have met with only one case of quinine purpura :—

A soldier, taking daily ·4 gm. of quinine, was admitted for purpura on June 12th. On June 7th he noticed an eruption on his arms, generalized the next day with bleeding from the nose and gums, and accompanied by muscular pains and lassitude. On the12th there were scattered purpuric patches on the skin and on the tongue and buccal mucosa ; on the 14th a fresh crop with gum bleeding. Quinine was stopped and the signs disappeared. On July 3rd a gram of quinine was taken ; 2½ hours later the gums bled freely with slight fever. July 17th, another gm. of quinine ; 2 hours later gum bleeding lasting 24 hours with petechial patches on the skin and muscular pains. Quinine was then finally stopped and no further manifestations occurred.

The authors compare this condition with haemoglobinuria, equally rare in North Africa. In each the dose of quinine is immaterial. According to MARCHOUX for quinine haemoglobinuria to appear there must be visceral lesions which may be transitory ; *i.e.*, a small dose of quinine may produce haemoglobinuria in a subject in whom two days later a much larger dose will not. Similarly the subject of this paper had taken quinine with impunity the previous year. They note also that with the purpura were present arterial hypotension, asthenia, bronzing, blood urea above the normal, conditions reflecting a state of organic insufficiency which prepared the ground for the action of quinine. A few figures are given of the state of the blood and urine.

A. G. B.

BIGINELLI (P.) & SCORDIA (F.). Valutazione quantitativa della chinina e chinidina nei chineti e negli alcaloidi secondari della china. (**Quantitative Test of Quinine and Quinidine in Quinetums and Inferior Cinchona Alkaloids.**)—*Riv. di Malariologia.* 1929. Sept.–Oct. Vol. 8. No. 5. pp. 534–537. [English summary p. 633.]

The four principal alkaloids found in cinchona bark are divisible into two pairs, quinine and quinidine and cinchonine and cinchonidine. The two members of the former pair contain one methoxyl group each and those of the latter pair no methoxyl group. A method for the estimation of methoxyl groups in organic chemical compounds has long been known depending on the conversion of the methoxyl group into methyl iodide by the action of hydriodic acid, the methyl iodide being distilled from the reaction mixture in a special apparatus, into an alcoholic solution of silver nitrate where it forms silver iodide, which is collected and weighed. The authors have applied this method to the determination of the amounts of quinine and quinidine in various cinchona alkaloid preparations. It is well known that the various cinchona alkaloids are not readily separable and it is therefore not surprising that by this method the authors found over 30 per cent. of quinine in each of three samples of cinchonidine tartrate and that three samples of " quinetum " supposed to contain 29·5, 37·5 and 20 per cent. of quinine were actually found to contain by this method 37·1,

44·3 and 32·4 of quinine and quinidine. It should be understood that the method estimates quinine and quinidine together and the results afford no indication of the relative amounts of these two alkaloids present.

T. A. Henry.

MANAI (Andrea). Ittero da plasmochina. [**Jaundice from Plasmochin.**]—*Policlinico.* Sez. Prat. 1929. Aug. 26. Vol. 36. No. 34. pp. 1215–1217. [1 ref.] [Inst of Path. & Clin. Med., Univ., Sassari.]

A girl of 17 years was given one tablet of 2 cgm. of plasmochin on March 5th, two on the 6th, three on the 7th. The following day there was a slight icteric tint, but three more tablets were given. The result was a marked jaundice which did not clear up for a week; no pruritus or bradycardia. A week later, to test whether this was due to the drug, three tablets were given on two successive days and the jaundice returned as before, the red corpuscles falling 20 per cent. The conclusion is drawn that plasmochin in the usual therapeutic doses can produce jaundice due to a toxic haemolysis.

H. Harold Scott.

DANZEL (Lucien). A propos de l'Hélianthe ou Grand Soleil plante industrielle et médicinale. [**The Sunflower in Industry and Medicine.**]—*Rev. Méd. et Hyg. Trop.* 1929. Sept.–Oct. Vol. 21. No. 5. pp. 158–163.

Sunflower was formerly employed in the treatment of malaria, and has been used by the author as a tincture in conjunction with quinine.

A. G. B.

i. CHRISTOPHERS (S. R.). **The Mixture Reaction in Haemolysis by Acids and Bases.**—*Indian Jl. Med. Res.* 1929. Oct. Vol. 17. No. 2. pp. 533–543. [4 refs.]

ii. ——. **Haemolysis by Acid and Base and by Acid and Basic Salts including Quinine and its Salts.**—*Ibid.* pp. 544–563. With 3 graphs. [7 refs.]

iii. ——. **The Electric Charge of the Red Blood Corpuscle, Haemoglobin and Stroma in Relation to Haemolysis.**—*Ibid.* pp. 564–573. With 4 graphs. [10 refs.]

i. The author suspended given quantities of washed red cell substance in 0·9 per cent. salt solution containing a known molecular concentration of acid (usually HCl) or base (NaOH). With either acid or base two distinct but related reactions may take place.

(1) A quick reaction, complete in 5 minutes, in which a proportion of the acid (or base) is taken up by the cells, and a proportion is left free giving a reduced H ion concentration to the supernatant fluid. This fixation of the acid (or base) may be an adsorption phenomenon, or may be due to the formation of a protein salt by the combination of NH_2 groups with HCl, or of COOH groups with NaOH.

(2) A slower reaction resulting in haemolysis of the protein complex. The interesting observation is made that, provided a sufficient initial concentration of acid or base is used, haemolysis takes place equally well and in about the same time whether the cells are left in the reaction mixture, or are removed from the mixture, washed, and resuspended in fresh *neutral* saline. Hence it appears that, contrary to the views of PONDER and MCLACHLAN (*Brit. Jl. Experim. Path.*, 1929, Vol. 8, p. 382), " subsequent haemolysis is not an indication of any

pari passu reaction on the medium, but is an affair of the cells themselves," and is a function of the amount of acid or base taken up by the cells in the initial quick reaction. If this amount is large haemolysis follows rapidly; if small, haemolysis either takes place slowly or not at all.

ii. Oxalated human blood was centrifuged, the deposit washed in 0·9 per cent. saline, and a suspension of a known weight of these cells made in 0·9 per cent. saline containing a known concentration of the haemolytic agent. The mixture was incubated at 37° C. for three hours, with occasional shaking.

All quantitative haemolytic effects by acid and base, acid and basic salts and such substances as quinine and quinine salts are dependent on a critical "haemolytic dose" absorbed by the cells in a quick reaction completed in five minutes (see previous paper). This critical dose which will just haemolyse 1 gram. of red cell substance in 3 hours at 37° C. is, for HCl 0·00016, for lactic acid 0·0002, for acetic acid 0·00026, and for boric acid 0·2 molecular concentration. Under these conditions a critical residual pH results in the supernatant fluid, being 5·0 for acetic acid and 5·6 for HCl.

Quinine, as regards limit of haemolytic effect, behaves as a base and does not appear to show any specific alkaloidal effect as distinct from its effect as a base. Similarly quinine dihydrochloride gives results which are almost exactly similar to an equivalent solution of HCl. Quinine monohydrochloride, on the other hand, gives peculiar results which are probably due to special conditions prevailing in regard to dissociation. Quinine sulphate is not sufficiently soluble to give the necessary concentration of acid for haemolysis.

The cause of haemolysis by acids and bases appears to be that the cell adsorbs H or OH ions with the formation of dissociable compounds with the proteins of the cell. There is thus introduced a state of electric charge, imbibition of water and other correlated effects such as osmotic effects due to increased dissociation of the proteinate. These associated changes cause the haemoglobin, which is normally a gel at or near the isoelectric point, to become dispersed beyond the critical point at which the gel state can exist. This conclusion is sharply opposed to the general supposition that haemolysis occurs when the isoelectric point of the *stroma* is approached, resulting in flocculation of the stroma and consequent liberation of the haemoglobin.

iii. This paper records observations, of a preliminary character, upon the electric charge carried by the red cell, haemoglobin, and stroma under certain circumstances, with a view to explaining the behaviour of the red cell under haemolytic influences.

Suspensions of red cells (human) were made in isotonic glucose solution, and washed, by centrifuging, in six lots of fresh glucose solution in boiled redistilled water. [The author differentiates between glucose and dextrose (Merck) which he considers clearly distinct, 5·8 glucose being isotonic while 6·0 dextrose (Merck) was necessary. The abstractor suggests that these differences may be due to the glucose used being anhydrous glucose while dextrose (Merck) may be glucose monohydrate.] Macroscopic observations were made using the cataphoretic tube of NORTHROP (Studies from Rockefeller Inst., 1923, Vol. 44, p. 219), while for microscopic observations, which gave results similar to the macroscopic method, the cataphoresis cell of BROWN and BROOM was used (*Brit. Jl. Experim. Path.*, 1929, Vol. 10, p. 61). In the macroscopic method a 1 per cent. suspension of red

cell substance in isotonic glucose was used, while in the microscopic method a suspension of 1·1 gm. per litre was found preferable.

Red cells washed as described in isotonic glucose show a negative charge with a velocity rate of about 3μ per second per volt per cm. The effect on this charge of the addition of electrolytes, sodium chloride (monovalent kation) thorium nitrate (tetravalent kation), of acid (HCl), and of base (NaOH), are given in a series of graphs. Graphs are also given for the cells, haemoglobin, and stromata, so far as these can be completed, under different additions of HCl and NaOH respectively.

The results obtained, together with the facts recorded in the previous paper, lead the author to reject the view usually held that haemolysis is due to liberation of the haemoglobin as a result of flocculation of the stroma protein on reaching or approaching its isoelectric point. Hence the author adheres to the explanation of haemolysis given in the previous paper (*q.v.*) and concludes that the point of greatest safety for the cell is that at which the *haemoglobin* has a charge approximating to zero, and haemolysis tends to occur when a charge of either positive or negative character is imparted to this substance.

H. Raistrick.

MANAI (Andrea). Sistema reticolo endoteliale e infezione malarica (prima memoria). [**The Reticulo-Endothelial System in Malaria.**] —*Haematologica.* Pavia. 1929. Vol. 10. No. 5. pp. 407–420. With 2 coloured plates. [1 ref.] [French summary p. 420.] [Inst. of Path. & Clin. Med., Univ., Sassari.]

This paper deals with an old haematological problem in malaria, *viz.*, the origin of certain forms of large mononuclear cells met with in the blood in particularly grave cases. The author gives an account of six cases of severe malignant tertian in which the red cells oscillated round 3 millions and the leucocytes ranged from 17,000 to 23,000 with a monocyte percentage of 46–54 per cent. The differential leucocyte counts in the 6 cases may be of interest.

Case.	Neutrophils per cent.	Lymphocytes per cent.	Eosinophils per cent.	Monocytes per cent.	Total Leucocytes.
1	38	10·5	1·5	50	22,500
2	35	16	1	46	17,200
3	35	15	1	47	19,200
4	31	12	4	54	23,600
5	33	15	2	50	21,200
6	33	15	1	51	21,700

The percentages of *atypical* monocyte forms in the above were, 40, 35, 35, 45, 40, 40. Coloured illustrations of these cells are presented. Some are endothelioid, but the most numerous monocyte forms have the characters of the plasma cell. The author is of opinion that these forms are probably derived from histiocytes of splenic origin. Granted that the spleen is the most injured organ, it is probable that in these grave cases it allows to pass into the general circulation elements of the R.–E. system resembling monocytes. These would still possess morphological features permitting their differentiation from the ordinary blood monocytes.

J. C. G. Ledingham.

TSCHERIKOWER (R. S.) & RUBINSTEIN (P. L.). Ueber die Bedeutung des retikuloendothelialen Apparates bei Infektionskrankheiten. IV. Das retikuloendotheliale System bei infektiösem Ikterus. [**Significance of R.E. Apparatus in Infectious Diseases. IV. R.E. System in Infectious Jaundice.**]—*Zent. f. Bakt.* I. Abt. Orig. 1929. Sept. 28. Vol. 114. No. 1/2. pp. 65–68. [5 refs.] [Microbiol. Research Inst., Education Commissariat R.S.F.S.R., Moscow.]

Twenty-five guineapigs were splenectomized and 24 hours later were infected with a rather weak strain of *Sp. icterogenes* (*L. icterohaemorrhagiae*). Twenty-one normal controls were also inoculated, the route of infection being intracardial. The results showed no significant difference between the two sets, 8 of the splenectomized and 5 of the controls succumbing to the infection. They infer that the protective action of the R.–E. system in this disease is unimportant or nil.

J. C. G. Ledingham.

KRITSCHEWSKI (I. L.) & RUBINSTEIN (P. L.). Ueber die Natur der Immunität bei Rückfallfieber. IX. Die Bedeutung des retikuloendothelialen Systems beim Rückfallfieber der Meerschweinchen. [**The Nature of Immunity in Relapsing Fever. IX. Significance of R.E. System in Relapsing Fever in Guineapigs.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Aug. 1. Vol. 62. No. 5/6. pp. 420–423. [5 refs.] [Microbiol. Research Inst., Education Commissariat R.S.F.S.R., Moscow.]

This is an extension of their previous work on spirochaetosis in rats and mice to guineapigs. Seventeen guineapigs were splenectomized. Of these, 16 succumbed to later experimental infection with relapsing spirochaetes, while all 12 normal guineapigs withstood infection. They conclude, therefore, that the R.–E. system is the only protective system in so far as resistance to experimental spirochaetosis is concerned.

J. C. G. Ledingham.

NIESCHULZ (Otto) & WAWO-ROENTOE (F. K.). Ueber den Einfluss der Milzexstirpation bei Infektionen mit *Trypanosoma gambiense* und *Schizotrypanum cruzi*. [**Effects of Splenectomy on Infections with** *T. gambiense* **and** *S. cruzi*.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1930. Vol. 65. No. 3/4. pp. 312–317. [6 refs.] [Inst. for Infectious Diseases & Parasit., Reich Univ., Utrecht.]

These authors have investigated the effect of splenectomy on the course of a trypanosome infection in dogs. Like KIKUTH and REGENDANZ (see previous reviews), but in opposition to KRITSCHEWSKI and SCHWARZMANN, they conclude that the spleen possesses a powerful influence on the course of infection of dogs with *T. gambiense*. With *S. cruzi*, on the other hand, extirpation of the spleen had no effect. Their opinion, therefore, is that the effects of splenectomy depend not only on the test animal employed, but also on the variety of test trypanosome.

J. C. G. Ledingham.

KRITSCHEWSKI (I. L.), BASKIN (M. M.) & LEBEDJEVA (M. N.). Ueber eine bisher unbekannte Funktion des retikuloendothelialen Systems. VIII. Zur Kenntnis der Funktion des retikuloendothelialen Systems, durch welche die Aktivität der ätiotropen Verbindungen im Organismus bestimmt wird. [**The Rôle of the R.E. System in determining the Effect of Chemotherapeutic Interference.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 64. No. 5/6. pp. 382–406. With 8 figs. on 2 folding plates. [Refs. in footnotes.] [Microbiol. Research Inst., Education Commissariat R.S.F.S.R., Moscow.]

This lengthy contribution is largely polemical, being concerned with criticisms by various writers of Kritschewski's main thesis that chemotherapeutic substances are taken up in the first instance by cells of the R.–E. system and are only slowly released therefrom to exercise their parasitotropic effects. The arrest of the substance by the R.–E. cells would, in fact, prevent a too rapid excretion of the drug from the body by the ordinary channels. This thesis is supported, in the authors' opinion, by the results of experiments designed to reveal directly this storage of the drug derivatives in the R.–E. cells by JANCSÓ's microchemical methods. Salvarsan and silversalvarsan, which are taken up by the R.–E. cells, are found to destroy trypanosomes when injected 5 days after the drug, whereas sulphoxylsalvarsan, which is not taken up by these cells, as microchemical tests show, has almost disappeared from the body by this time. What is left is incapable of keeping the infection in check. In splenectomized and blockaded animals, Jancsó's technique shows that salvarsan and neosalvarsan collect in the capillaries of all organs either owing to lack of histiocytes following splenectomy or to the fact that the remaining histiocytes are already blocked by the dye. Photomicrographs are supplied of organ sections (liver, spleen, lung, brain) from splenectomized and blockaded animals after intravenous injection of salvarsan, with a parallel series from normal animals.

J. C. G. Ledingham.

i. KRITSCHEWSKI (I. L.) & FRIEDE (K. A.). Ueber eine bisher unbekannte Funktion des retikuloendothelialen Systems. IX. Ueber die Rolle des Retikuloendothels bei der Wirkung von Medikamenten und Giften. [**The Rôle of the R.E. System in the Action of Medicinal and Toxic Substances.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1930. Vol. 65. No. 3/4. pp. 254–263. [4 refs.]

ii. —— & SCHAPIRO (S. L.). Ueber die Natur der Immunität bei Rückfallfieber. XI. Ueber die Schutzfunktion der nicht mit Eisenzucker blockierten Histiozyten des ausserhalb der Milz gelegenen Teiles der retikuloendothelialen Systems. [**Protective Function of the Unblockaded Histiocytes.**]—*Ibid.* pp. 264–275. [20 refs.]

i. In continuation of the efforts of Kritschewski and his collaborators to demonstrate the dependence of chemotherapeutic efficiency on the intactness of the R.–E. system (see many previous reviews), Kritschewski and Friede have sought to determine whether the action of chemical poisons like KCN and toxic alkaloids such as strychnine,

caffein and morphine is similarly influenced. Mice were splenectomized and 48 hours later the drugs were given subcutaneously (0·05 cc. to 1 gm. body weight). With most of the substances tested there was a considerably higher proportion of deaths among splenectomized than among normal mice. The authors' explanation of the phenomenon is that if the R.–E. system is intact, the toxic substances are first absorbed by the R.–E. cells and thereafter are only slowly let loose in diminished concentration, whereas if the R.–E. system is interfered with, the toxic substances get immediate access to vital organs *via* the blood stream.

ii. This paper deals with criticisms of the authors' view that in relapsing fever the R.–E. system is the chief locus of defence. A further set of experiments is placed on record in which the course of *recurrens* infection is followed in two sets of mice: (1) splenectomized mice subsequently blockaded intravenously with sugar of iron; and (2) splenectomized mice subsequently blockaded intravenously with sugar of iron and also subcutaneously with trypanblue. The further blockade with trypan blue effects, according to the authors, a more complete dislocation of histiocyte function. If the strain of spirochaetes is of low virulence splenectomy and blockade with sugar of iron may leave a sufficient number of functioning histiocytes to preserve life. The results of the experiments on the two groups of splenectomized mice supported the authors' contention.

J. C. G. Ledingham.

Kikuth (W.) & Regendanz (P.). Ueber die Beziehungen der chemotherapeutischen Mittel zum "Retikuloendothel." [**Relation of Chemotherapeutic Substances to R.E. System.**]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 61. No. 5/6. pp. 422–432. [10 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

In many papers (reviewed in this *Bulletin*) dealing with the influence of splenectomy and blockade on the action of chemotherapeutic substances, the authors have, as a rule, interpreted the observed diminution or complete abeyance of the usual drug effect as indicating that some special function of the R.–E. system to determine the efficacy of a drug has been put out of action by the operative procedure. Kikuth and Regendanz are not satisfied with this interpretation and they enquire here how far the diminished action of the drug in blockaded animals may be due simply to some loss of natural resistance, not necessarily expressed in terms of antibodies. If we assume that the destruction of the test organism is due to the combined action of the drug and the specific antibodies manufactured presumably in the spleen and R.–E. system, then the effect of the splenectomy would be to reduce the latter mode of defence. Kritschewski had attempted to exclude any participation of specific antibodies by giving the drug before the appearance of parasites in the blood, but it is the opinion of Kikuth and Regendanz that, while specific antibodies can certainly be removed from consideration owing to the short period of infection, natural defence in the more general sense may be severely disturbed by the operative procedure. An infection would thus run a more severe course in the splenectomized animal. Kikuth and Regendanz for example found, in opposition to Kritschewski, that removal of the spleen in rats may render a *T. lewisi* infection very severe or fatal.

In such animals also the action of the chemotherapeutic substance was greatly diminished. To secure further knowledge on this subject, Kikuth and Regendanz extend their work to larger animals, guineapigs and rabbits and find that in these splenectomy does not affect the course of infection with *T. brucei* or the normal action of germanin. They conclude, therefore, that the reduced effect of germanin on splenectomized rats and mice is due to loss of natural defence and not to the abeyance of a special function of the R.-E. system, as postulated by KRITSCHEWSKI. In rats and mice, which for their size have large spleens, interference with their function may have a much more serious effect on the course of an induced infection than it appears to have in the larger animals studied.

J. C. G. Ledingham.

LEGENDRE (J.). Défenses naturelles contre les moustiques (agro-prophylaxie et pisciculture.) [**Natural Means of Defence against Mosquitoes.**]—*Ann. de Méd. et de Pharm. Colon.* 1928. Jan.–Feb.–Mar. Vol. 26. No. 1. pp. 42–82. [18 refs.]

In this essay Legendre brings together much that he has published elsewhere. He deals with the employment of domestic animals for the protection of human beings from attack by mosquitoes and traverses once more the question of zoophilous breeds of these insects. There are notes on the replacement of one mosquito by another, the cultivation of fish in rice fields, the acclimatization and transport of special fish, and an outline of antimosquito work in Madagascar. The concluding paragraphs are a plea for the simplicity and usefulness of catching adult mosquitoes.

J. F. C. H.

LEGENDRE (F.). Inconvénients provoqués dans la lutte antilarvaire par l'emploi de demi-mesures concernant les terrains immergés. [**Failure of Half Measures in Antilarval Work.**]—*Bull. Soc. Path. Exot.* 1928. Apr. 18. Vol. 21. No. 4. pp. 346–347. [Anti-malaria Service, Antananarivo.]

In Madagascar it was thought to protect the town of Antananarivo against anopheles by ordering the cessation of rice culture in a particular area. The law was complied with, but no measures for drainage of the area (150 hectares) were simultaneously arranged. Such half measures made the state of affairs worse than ever. The rice fields became a swamp, breeding anopheles in greater number than before.

J. F. C. H.

DUREN. La lutte antimoustique à Léopoldville. [**Antimosquito Work in Leopoldville.**]—*Ann. Soc. Belge de Méd. Trop.* 1928. June. Vol. 8. No. 1. pp. 41–46.

Leopoldville (East) has a mosquito squad consisting of 16 men and a foreman who deal with overgrowth of vegetation, 5 oilers and 5 searchers for breeding places. These are native employees and they

are reported to carry out their work efficiently and without serious annoyance to European residents.

Lists are given of the genera and species of larvae captured. In shaded places *A. smithii* is the prevailing anopheles and in cleared zones *A. costalis*. No satisfactory larvivorous fish has been discovered locally as yet.

J. F. C. H.

HAMLYN-HARRIS (Ronald). **The Relative Value of Larval Destructors and the Part they play in Mosquito Control in Queensland.**—Reprinted from *Proc. Roy. Soc. Queensland.* 1929. July 26. Vol. 41. No. 3. pp. 23–38. With 19 figs. on 8 plates. [35 refs.] [Health Dept., City Council, Brisbane.]

This interesting study of Queensland's natural enemies of mosquitoes emphasizes the fact that this aspect of malaria control, like most others, is a local problem. Queensland is fortunate in possessing some very efficient larvivorous fish effective in fresh, brackish and salt water, and local fish seem likely to control mosquito breeding in irrigated rice fields, at least in the early stages of the cultivation. Towards the end of the rice season the rate of mosquito multiplication seems to outrun the appetites of their many enemies. Artificial stocking with larvivorous fish would perhaps redress the balance.

J. F. C. H.

DUREN. Note sur l'emploi de la créoline comme larvicide. [**Creoline as a Larvicide.**]—*Ann. Soc. Belge de Méd. Trop.* 1928. June. Vol. 8. No. 1. pp. 23–25.

Laboratory experiments were made with "créoline" [not further specified, but stated in "*Larousse*" to be *huile lourde du goudron*], and the minimum proportion for application to water breeding larvae is stated to be 2/10,000 or 200 gm. per cubic metre, renewed every 10 days. It is too expensive for use in deep water, but is recommended for application to shallow water of considerable surface. [Nothing is said of possible effects on vegetation, fish, domestic animals or man.]

J. F. C. H.

WALLACE (R. B.). **Reduction in Oiling at Certain Seasons.**—*Malayan Med Jl.* 1929. Sept. Vol. 4. No. 3. pp. 92–96. With 1 text fig. [1 ref.]

This is an account of a short experiment undertaken to ascertain whether the oiled area could safely be reduced from one half to one quarter of a mile on an estate in Malaya during the season when malaria appeared to be little prevalent. The work is described as only a preliminary trial, but it suggests that there is a season when *A. maculatus* is less dangerous than at other times.

During the period of limited oiling *A. maculatus* increased outside the quarter-mile radius with no increase in the malaria rates and an appreciable saving in oiling costs.

J. F. C. H.

GINSBURG (J. M.). [**Studies of Mosquito Oils and Dust Larvicides.**]—*Proc. 15th Ann. Mtg. New Jersey Mosquito Exterm. Ass., Atlantic City, 1928.* New Brunswick, N.J. 1928. pp. 53–65. [3 refs.] [Summarized in *Rev. Applied Entom.* 1929. July. Vol. 17. Ser. B. Pt. 7. pp. 137–138.]

A study of various oils has indicated that an oil for antimosquito use should possess approximately the following characters:

Specific gravity—32–37° Bé.
Flash point—150° F.
Cold test—0° F.—pour.
Boiling range—350–675° F.
Color—Straw to Yellow.
Viscosity—50–100 Sayb/100.
Surface tension—20 dynes per cm.

The tests were made upon various culicines in brackish and fresh water. The importance attaching to some of the above characters is indicated. Lethal action upon mosquito larvae was not the only quality considered, such factors as ease, safety and pleasantness in handling also influencing the choice.

Some larvicidal powders were tested. Stoxal was not effective, but a dust known as " No. 15 " and said to consist of " Kaolin saturated with about 20 per cent. fuel oil and 6 per cent. high-boiling point hydrocarbons " gave satisfaction.

J. F. C. H.

BAUVALLET (H.). Essai de lutte antilarvaire par l'emploi de poudre larvicide, dans une zone inondée du Bas-Dahomey. [**Antilarval Measures with Stoxal in a Flooded Area.**]—*Bull. Soc. Path. Exot.* 1928. Apr. 18. Vol. 21. No. 4. pp. 323–325. With 2 text figs.

An account of an apparently successful use of stoxal as a larvicide. [The details given are meagre and the evidence of the efficiency of the powder is unconvincing.]

J. F. C. H.

SCHUURMAN (C. J.) & HUININK (A. Schuurman-ten Bokkel). **Application of Paris Green as an Anopheles-Larvicide (Second Report).**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1929. Vol. 18. No. 1. pp. 143–150. With 2 plates. [1 ref.] [Med. Lab., Weltevreden.]

This careful study adds to the evidence already available as to the efficiency of Paris green as a larvicide and its harmlessness to domestic animals. In connexion with the latter point fish living in the treated ponds were analysed for their arsenic content which, after the use of the green for 5 months, was such that it would be necessary to consume 22·5 kgm. of fish to take 5 mgm. of arsenic. For a like dose of arsenic it would be required to drink 125 litres of the pond water.

J. F. C. H.

BRAIMBRIDGE (C. V.). **Some Remarks on the Relation between Rainfall and Prevailing Diseases in Nairobi.**—*Kenya & East African Med. Jl.* 1929. June. Vol. 6. No. 3. pp. 73–74. With 3 charts on 1 folding plate.

The monthly rainfall and the monthly admissions to hospital for malaria, dysentery and lobar pneumonia are charted for the three years 1923–1925. The data are insufficient to justify any conclusions [including even the very cautious remarks of the author.]

J. F. C. H.

LEITCH (J. Neil). **A Health Campaign among 7,000 Tea-Garden Coolies.**—*Far Eastern Assoc. Trop. Med. Trans. Seventh Congress, British India, 1927.* Vol. 1. pp. 641–652. With 2 text figs., 5 figs. on 1 plate & 2 folding charts.

There is nothing very novel in this paper, but those in circumstances similar to the author's, who wish to reorganize their work on preventive lines, will find Dr. Leitch's arrangements helpful.

J. F. C. H.

JACOCKS (W. P.). **A Note on a Type of Latrine Suitable for Use in Ceylon Villages.**—*Ceylon Jl. Sci.* (Sect. D. Med. Sci.) 1929. Feb. 13. Vol. 2. Pt. 2. pp. 87–89. With 3 plates.

Jacocks recommends the use of a squatting plate of galvanized steel of length 3 ft. 8½ in., breadth 2 ft. 2½ in., thickness, 18 gauge. The dimensions "represent the most economical cutting of the galvanized sheets." The hole is machine-punched and measures: back, 6½ in.; front, 5¼ in.; length, 16 in., and should be 10 in. from the back of the plate. The cost of such a plate in Ceylon is Rs. 4 or less.

[The author tilts against the undue cost of many latrine recommendations in relation to poor villagers' means, but of his own recommendation he says "it is quite possible that the cost . . . might be beyond the purchasing power of the villager."]

J. F. C. H.

LOW (G. Carmichael). **Presidential Address. A Retrospect of Tropical Medicine from 1894 to 1914.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Nov. 25. Vol. 23. No. 3. pp. 213–232.

This retrospect must be read in its entirety. It will be sufficient here to give Dr. Low's headings—Malaria (1894–1898); the Foundation of the Schools of Tropical Medicine (1898–1899); Filariasis (1899–1900); Yellow Fever (1900–1901); Trypanosomiasis (1901–1903); Ankylostomiasis (1901–1902); Kala Azar (1903–1904); Undulant Fever (1904); Schistosomiasis (1904–1907); the Use of Intravenous Antimony (1906–1914); the Foundation of the Society of Tropical Medicine and Hygiene (1907); Plague (1907); Beriberi (1907–1909); the Use of Emetine (1911–1912). Dr. Low thinks that some of the most remarkable discoveries ever made in medicine, both in the etiology and treatment of disease, were recorded during the period 1894 to 1914, and few will be found to dissent.

A. G. B.

ROUSSEAU. Les maladies transmissibles observées dans les colonies françaises et territoires sous mandat, pendant l'année 1927. [**Transmissible Diseases in the French Colonies and Mandated Territories in 1927.**]—*Ann. de Méd. et de Pharm. Colon.* 1929. Apr.–May–June. Vol. 27. No. 2. pp. 145–246. [1 ref.]

The introductory statement tells us that 1927 was memorable chiefly for the recrudescence of cholera in Indo-China, the severe epidemic of yellow fever in French West Africa and the increased activity of plague in the same region. On the other hand smallpox is tending to disappearance, and plague is decreasing in Madagascar and Indo-China. An epidemic focus of sleeping sickness came to light in Togoland. The author expects to see the arrest of this disease in Equatorial Africa and Cameroon before long.

The diseases are then considered in turn under the headings :—

Malades pestilentielles (plague, cholera, yellow fever, typhus, smallpox).

Maladies endémo-épidémiques (malaria, blackwater, dysentery, trypanosomiasis, dengue, relapsing fever, intestinal parasitism, schistosomiasis, filariasis, dracunculosis, beriberi, phagedenic ulcer, yaws).

Maladies transmissibles communes à la métropole et aux colonies (pneumococcus infection, cerebrospinal meningitis, influenza, enteric, measles, diphtheria, scarlatina, mumps, varicella, trachoma, rabies).

Maladies sociales (tuberculosis, V.D., leprosy, cancer). Naturally the information under some heads is much greater than under others.

A. G. B.

INTERNATIONAL LABOUR REVIEW. 1929. July. Vol. 20. No. 1. pp. 95–109. [3 refs.]—**The Protection of the Health of Groups of Native Workers in the French Colonies.**

An account is given of a remarkable report by Dr. HECKENROTH, who stresses the enormous effort of organization, finance and charity required to protect native workers. Increasing shortage of native labour makes the matter urgent ; the native population is being reduced yearly by 4 to 20 persons per 1,000. A native recruited for industry must be so watched over as to render his condition similar to benevolent slavery, whether he be employed near his home or at a distance.

Reduction in organic resistance occurs in workers who leave their own district ; transplantation produces profound physical and moral disturbance, quite apart from exposure to infectious diseases to which they are unaccustomed and hence liable to succumb.

A native is attached to his own kin, customs, village and field. Too intensive recruiting may compromise a district, so that land falls out of cultivation and small local industries die out. Transport, whether by road, train or water, is fraught with dangers. The workers must be housed, fed and clothed ; each calls for scientific study. Ill-nourished, without suitable dwellings, improperly clad and lacking medical care, native labour must have a terrible mortality. Contracts should be short and repatriation strictly observed. Rations should be issued in kind to prevent economizing on food. Allotments, cultivated by the workers, are to be encouraged ; but native foods must be analysed to determine their calorie and vitamin values. Natives should be housed according to their customs, precautions being taken against cold at night. Clothing should be the responsibility of the employer. Epidemic and endemic disease can only be controlled by

organized hygiene carried out by employers. The subject is in its infancy; but much is known, and something is already being attempted to ensure that natives can be safely employed in industry.

E. L. Collis.

BULLETIN OF THE RUBBER GROWERS' ASSOCIATION. 1929. Sept. Vol. 11. No. 9. pp. 639–648. With 1 text fig.—**Central Health Board. A Summary of the Organization under the Health Boards Enactment No. 7 of 1928.**

It is impossible to condense this interesting account of administrative medical arrangements in Malaya, but it is well worth reading by all who are faced with similar problems. The guiding principles of the Enactment are as follows :—

" (i) It is primarily the duty of every landed proprietor to carry out proper and reasonable preventive measures on his own land.

" (ii) That an equal standard of health control shall be adopted for the whole of the Federation."

" (iii) That estates which can prove that the work done in the past towards health control has been sufficient to raise them to the required standard shall be exempt from the new cess for health purposes."

The new organisation provides that:—

" (*a*) Each estate will have a hospital to which to send its patients.

" (*b*) A Registered Medical Practitioner will visit all estates and carry out measures of prevention of disease.

" (*c*) Schemes of measures of prevention of disease will be framed where necessary to co-ordinate work between estates and for the control of lands adjoining estates.

" (*d*) Later when health conditions on estates and the land adjoining estates have been made satisfactory, measures for the improvement of health could be extended to the remote kampong areas, when trained men and a knowledge of detailed requirements is available."

J. F. C. H.

LEGENDRE (J.). Colonies et démographie. [**Colonies and Demography.**]—*Ann. de Méd. et de Pharm. Colon.* 1928. Oct.–Nov.–Dec. Vol. 26. No. 4. pp. 395–408.

A well-written plea for the improvement of the demographic records of colonial possessions. The author urges the desirability of an agreement between the great colonizing states to the end that uniform mortality and morbidity statistics of isoclimatic zones might be prepared. He cites and comments on some demographic data of French possessions, pointing out the difficulties of interpretation. Thus the European population of Hanoi show a considerable natural increase, much greater than that of France herself, but the direct comparison is vitiated not only by the wholly different age constitution of the population, but also by the fact that not only the residents in the town but other white women in the province come to Hanoi for their confinements.

The author concludes that the black races when brought into contact with whites have a higher rate of natural increase than when isolated.

M. Greenwood.

FISCHER (W. O.). **A Preliminary Report on 1,402 Consecutive Autopsies on Native Mine Workers.**—*Jl. Med. Assoc. South Africa.* 1929. Sept. 28. Vol. 3. No. 18. pp. 511–516.

The autopsies which are the subject of this paper were made in the period 1922–1928 at the City Deep Central Native Hospital, 663 of them by the author. The patients at this hospital are male natives in the 2nd, 3rd and 4th decades from either the Union of S. Africa or the southern part of Portuguese East Africa. From a table which shows the principal causes of death the table given here (No. 1) is an abridgement.

TABLE I.

Year.	Total deaths from diseases.	Autopsies performed per year.	Tuberculosis total.	Lobar pneumonia.	Broncho-pneumonia.	Enteric fever.	Amoebic dysentery.	Bilharziosis.	Epidemic cerebro-spinal meningitis.	Pneumococcal meningitis.	Carcinoma.	Chronic nephritis.	Acute pericarditis.	Miscellaneous.
1922	148	84	25	23	9	4	—	1	11	—	2	—	2	7
1923	226	159	27	47	12	19	—	2	13	—	—	2	4	30
1924	257	167	45	58	16	9	1	1	1	1	1	2	3	24
1925	190	155	46	49	7	12	2	—	12	4	1	1	3	13
1926	242	215	51	90	18	10	1	2	15	2	—	2	3	15
1927	329	316	64	101	32	25	4	4	35	3	1	2	3	37
1928	326	306	44	100	31	41	7	5	15	4	6	1	2	41
Total	1,718	1,402	302	468	125	120	15	15	102	14	11	10	20	167

Table 2 gives the percentages to the total deaths of the four chief causes of mortality.

TABLE II.

Year.	Lobar pneumonia *vs.* Broncho-pneumonia.	Tuberculosis.	Enteric fever.	Epidemic cerebro-spinal meningitis.
	Per cent.	Per cent.	Per cent.	Per cent.
1922	38·1	29·8	4·76	13·1
1923	37·1	17·0	11·9	8·2
1924	44·3	26·9	5·4	0·59
1925	36·1	29·7	7·7	7·7
1926	50·2	23·7	4·7	6·97
1927	42·1	20·3	7·9	11·1
1928	42·8	14·4	13·4	4·9
	42·2	21·5	8·6	7·3

79·6 per cent. of all autopsies.

Note that while the ratio of deaths from tuberculosis has decreased that for pneumonia has increased.

Lobar Pneumonia.—468 deaths, or 33·3 per cent.; in 173 cases the pneumonia was double. The gross pathological changes were invariably those of a pneumococcal infection. A table shows the number and percentages of involvement of the various lobes. Some degree of pleural inflammation was always present; acute fibrinous pericarditis in 11·5 per cent.

Tuberculosis.—302 deaths. This is classified under 12 heads; the commonest forms were acute miliary (136 cases), pulmonary (48), general (42), pulmonary with silicosis (30), abdominal (22). A feature of the miliary tuberculosis cases was enlargement of the spleen, which in 56 cases weighed 500 gm. or more; the majority of these patients were from P.E.A. Among the rarer headings there were 2 cases of tuberculous liver abscess.

Enteric Fevers.—120 deaths. In 29 cases there was extensive sloughing on the ileo-caecal valve. A table shows that the chief complications were, broncho-pneumonia (56 cases), peritonitis following perforation (24), acute nephritis (12), intestinal haemorrhage (8).

Other rarer Diseases.—Under dysentery it is stated that of 18 cases in which dysentery was the cause of death, in 15 *Ent. histolytica* was found. Eleven of the natives were from the East Coast, which also provided the 4 cases of amoebic liver abscess. Ankylostomiasis was regarded as the cause of death in 4 cases; in 17 others there were many hundreds of these worms, and it is noted that in every instance death was due to a lung disease—pneumonia or tuberculosis. Schistosomiasis accounted for 15 deaths, and ova or worms were found in 258 cases, which the author thinks much understates the real incidence. Of the 13 cases of malignant tumour, 11 were carcinoma (9 of the liver). It is further noted that multilobular cirrhosis of the liver was found in 10 per cent. of East Coast natives and in 2·5 per cent. of Union natives, and that chronic nephritis "of the intestinal type" was present in 15·8 per cent. of East Coast and 11·3 of Union natives. [The author gives no indication of the relative numbers of these two classes.]

A. G. B.

CHOISSER (R. M.). **Pathology in the Tropics. A Study based on the Review of 700 Consecutive Autopsies in Haiti.**—*U.S. Nav. Med. Bull.* 1929. July–Oct. Vol. 27. Nos. 3–4. pp. 551–568. With 15 figs. on 8 plates.

The author has for three years been pathologist to the Haitian General Hospital, Port au Prince, to which Haitians from all over the Republic are admitted, the great majority of pure-blooded African type. He presents a review of his first 700 autopsies.

Respiratory System.—Pulmonary tuberculosis accounted for 26 per cent. of all the deaths. The author notes that if this high mortality rate were to result from some acute disease great anxiety would be felt and remedial steps would be taken, but with tuberculosis it is not so. During his three years he has not seen a case of arrested pulmonary tuberculosis in a Haitian. Most cases occur between 20 and 30 years and the disease runs its course in 5–6 months. The necropsy findings fall into three well-defined groups: (1) Ulceration and cavity formation of both lungs with extensive miliary lesions of all organs; lungs almost

completely destroyed ; (2) a similar picture, but the disease is limited to the thorax ; (3) small cavities in the lungs ; all viscera above and below diaphragm stuffed with miliary tubercles. Lobar pneumonia accounted for 55 persons, or 8 per cent.

Gastro-intestinal System and Helminthiasis.—Diseases of this system killed 33 or 4·7 per cent. of the cases ; 13 were typhoid. There was no case of bacillary or amoebic dysentery, but amoebic dysentery and balantidiasis have been seen in the wards. One case of acute gastritis and three of gastric ulcer were noted, on which the author comments that the common use of alcohol and highly seasoned food do not seem to predispose to that condition. Acute peritonitis and carcinoma of the stomach made up this series. Only 9·7 per cent. showed worms, which is attributed to the fact that routine worm treatment is given on admission. The species were round and whip worms and Necators ; no Old World species of the hookworm were found. Two cases of heavy strongyloides infestation are described, in which profuse diarrhoea was followed by emaciation, exhaustion and death ; no other cause could be found for death.

Liver and Spleen.—There were 5 cases of cholelithiasis and 10 of cirrhosis, but of these last 7 were relatively mild and secondary to other diseases ; one case of primary carcinoma of the liver and two of secondary carcinoma. Many of the enlarged spleens were believed to be malarial, but smears were not made from all ; 15 per cent. of patients admitted harbour malarial parasites. The average weight of the spleens was 180 grams.

Genito-urinary System.—Chronic interstitial nephritis heads the list with 61 deaths, 8·7 per cent. Though many cases of " renal colic " are reported, in only one instance was a renal calculus found.

Diseases of Nervous System.—There were 18 deaths from meningitis, 2·5 per cent. of the whole, 12 due to the pneumococcus, 5 to the meningococcus and 1 to tubercle ; of the pneumococcus cases 10 followed infection of the middle ear. Spontaneous intracranial haemorrhage was found in 5 cases, 3 in young adults infected with yaws, and 2 in old people with serum reaction 4+.

Cardio-vascular System.—Only 2 cases of mitral endocarditis, both of ulcerative type ; and 4 cases of chronic mitral disease which produced no symptoms in life. The author thinks these findings extremely low, specially since focal infection is present in almost all persons admitted. He notes that acute rheumatic fever is practically never seen.

Malaria.—Six deaths, all malignant tertian. The patients were admitted in coma and thick blood film showed abundant *P. falciparum*, but no crescents.

" The brains upon examination were pinkish gray in color, edematous, and firm to touch. When sectioned the white matter was congested and showed numerous scattered areas of punctate hemorrhages. Smears from the brain substance, stained with Azur-II eosin, showed the capillaries engorged with pale red cells containing young gametes. The parasites were rather large, oval in shape, with a thick pale blue cytoplasm and a central clump of pigment. These forms of the parasite are called by Dr. H. C. Clark, director of the laboratories of the Gorgas Memorial, sexual ovoids. They are found only in the brain, spleen, and bone marrow, apparently never invading the peripheral blood stream."

The author suggests that the parasites may attain full development in the spleen and marrow (where crescents were found) but not in the

brain, "as their large size blocks the capillaries producing infarction and death before the parasite has time to attain full development."

Malignancy.—The author disagrees with those who state that cancer is extremely rare in people of the African race. His figures correspond closely to those of the Congo. 27 deaths, or 3·8 of the whole, were due to malignant tumours, 24 from carcinoma and 3 from sarcoma. The cancer cells were of embryonic, anaplastic type, and one would expect early metastases, but such were rarely observed.

Yaws.—90 per cent. of the bodies showed evidence in the arterial system of "treponematosis," but whether yaws or syphilis is uncertain. There were 10 definite cases of yaws, with negative history of syphilis and no scars on the genitalia; in 8 of these was aortic aneurysm, in one a gumma, and in one a spontaneous cerebral haemorrhage. The pathology, however, of these cases and those of "treponematosis" was so similar that they could not thereby be differentiated. This section will be treated more fully elsewhere.

A. G. B.

MELHORN (K. C.). **Public Health in Haiti. A Résumé of 10 Years' Work.**—*U.S. Nav. Med. Bull.* 1929. July–Oct. Vol. 27. Nos. 3–4. pp. 568–573.

This short article, packed with information, gives an account of the work of the U.S. Naval Medical Corps in Haiti since the National Public Health Service was created by law in February, 1919. Up to the time of the American occupation little had been done. The country was mountainous, and almost without roads, with a population of two millions, mostly illiterate. Such public health service as existed was poorly financed. The article describes the organization set up, hospitals, rural clinics, disposal of refuse, control of mosquitoes and malaria, and of water-borne diseases, the school of medicine, hospital training, training of nurses, school health service, health centres. Twenty United States naval medical officers are employed. The country now possesses 11 modern hospitals with capacities of from 60 to 400 beds. To combat the three most serious disease conditions—yaws, malaria and intestinal parasites—a system of rural clinics was inaugurated in 1926; they number 142 and in 1928 the total consultations and treatments exceeded 866,000. Travelling clinics have lately been provided. The capping of springs and installation of chlorination units has led to a great reduction of enteric fever at Port au Prince. By the reorganization of the National School of Medicine with the aid of the Rockefeller Foundation Haiti possesses "a unit second to none in the public health service," of which the Haitians are taking full advantage. From the training school for nurses, formed in 1918, 81 have graduated. Of the school health service the author writes: "Gratifying, indeed, is it to witness the eagerness with which students, parents, teachers and the press are becoming interested in the cardinal principles of hygiene and sanitation."

A. G. B.

BURKE (Alice M. B.). **Report of the Pathology Department of the School of Tropical Medicine for the First Three Years ending April 15, 1929.**—*Porto Rico Jl. of Pub. Health & Trop. Med.* 1929. Sept. Vol. 5. No. 1. pp. 48–53.

In the first three years of the work of the Pathology Department specimens from 1,950 surgical procedures were received from 137

physicians in the Island. There were 225 autopsies, a significant number when it is recalled that prior to the opening of the Tropical School a complete post-mortem examination was a rarity in Porto Rico. In a San Juan hospital the percentage of autopsies exceeded 50. A table shows the frequency of some tropical diseases in the 225 cases :—

Uncinariasis	44	Leprosy	7
Schistosomiasis	30	Sprue	4
Trichuriasis	30	Filariasis	3
Malaria	13	Pellagra	3

In most cases they were but contributory causes of death ; e.g., of the 13 malaria autopsies the plasmodium was the lethal agent in seven. Not a single instance of dysentery, bacillary or amoebic, was encountered. Other conditions absent were rheumatic heart lesions. Aortic disease of luetic origin occurred 22 times with six aneurisms. There were 48 instances of broncho-pneumonia and 14 of lobar pneumonia. For tuberculosis, the character of the lesions and their distribution shows no essential difference from what is seen in U.S.A. [No figures given here.] An unexplained phenomenon was the frequency of a marked eosinophilic infiltration of tissues, especially the appendix and other parts of the intestinal tract. In the general statistics one notes 142 tonsillectomies, 163 appendectomies, 319 malignant tumours and 202 benign tumours. Statistics of the nature and localtion of the tumours are added. [The population of Porto Rico in 1920 was, white, 948,000 ; black, 49,000 ; mulatto, 301,000. No figures of race are given in Dr. Burke's paper.]

A. G. B.

HASLAM (J. F. C.). **Some Health Problems of British Guiana.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Aug. 26. Vol. 23. No. 2. pp. 119–144. With 1 map & 9 figs. on 5 plates. [1 ref.]

This is a very readable address illustrated with some good photographs. After an account of the country and people (11 pages), in which the difficulties of the health officer are clearly brought out, the author considers in turn housing, water supply and sewage disposal. All have their special problems in a country in which the coast lands, where the bulk of the population is found, are mostly over 4 feet below the high level of spring tides. It may be hoped that recent changes will make it impossible in the future to write : " There are ninety-nine rural areas with their own local authorities who, from ignorance, indifference, or it may be interest, do not, or cannot, administer the powers conferred upon them." Diseases are not considered in this paper, but hookworm prevention is touched on. Dr. Haslam favours efficient, periodical mass treatment with diagnosis of the disease (as distinguished from the infection) by symptoms and the examination of a single smear.

A. G. B.

MENK (W.). Infektionskrankheiten in Zuckerplantagengebieten der Provinz Oriente de Cuba. [**Infectious Diseases in Sugar Plantations in Cuba.**]—*Zent. f. Bakt.* I. Abt. Orig. 1929. Oct. 31. Vol. 114. No. 4/6. pp. 345–354.

The author is Bacteriologist and Radiologist at the Banes Division Hospital, Cuba, of the United Fruit Company of America. He has reported in the Annual Reports for 1926, 1927 and 1928 of the Medical

Department of that Company the results of his work. The total number of cases and deaths in hospital were: In 1926, 3,945 and 103; in 1927, 2,157 and 105; in 1928, 1,721 and 62.

The morbidity and case mortality percentages of the various diseases observed in 1928 were: Malaria 18·3 and 0·3, external causes (wounds and accidents) 23·5 and 0·7, bronchitis 3·5, venereal diseases 4·3, phlegmon and acute abscess 3·8, pneumonia 3·1 and 31·5, ancylostomiasis 2·0, blackwater fever 0·4 and 14·3, cutaneous ulcers 0·6, typhoid fever 2·2 and 10·5, pulmonary tuberculosis 1·5 and 44·4, appendicitis and typhilitis 2·6 and 2·3.

E. D. W. Greig.

JAMAICA. **Report of the Co-Operative Public Health Work in Jamaica during 1928** [WASHBURN (B. E.), Director].—8 pp. With 1 map in text. 1929. Kingston.

Jamaica is fortunate in having arranged with the International Health Division of the Rockefeller Foundation to conduct a co-operative health campaign. Dr. Washburn here outlines the developments which have been possible. These are such as many health officers in the tropics visualize but never see.

Jamaica is advancing from generalized health work to the tackling of definite problems, and is particularly fortunate in having the co-operation and support of the Foundation's officers in conducting surveys regarding malaria and tuberculosis as a preliminary to attacking these diseases.

Dr. Washburn himself has been responsible for the work of health education and in this very important branch he has achieved quite evident success.

J. F. C. H.

FABRE (J. A.). Etude sur la mortalité à Pointe-à-Pitre (Guadeloupe), du 1er juillet 1923 au 30 juin 1928 (5 ans). [**Vital Statistics of Pointe-à-Pitre, 1923-1928.**]—*Ann. de Méd. et de Pharm. Colon.* 1928. Oct.–Nov.–Dec. Vol. 26. No. 4. pp. 426–434.

This is a study of the vital statistics of Pointe-à-Pitre (Guadeloupe) for the quinquennium 1923–28. The crude rate of mortality (persons) was 18·99 per 1,000 living; the ratio of deaths in the first year of life to live births was 13·5 per cent., a figure above the average for France; the ratio of deaths at ages 1–7 years to births was also above the French average; at later ages the mortality did not appear to differ greatly from that of the mother country. The author, using a somewhat arbitrary coefficient of salubrity, concludes that mortality is higher in those parts of the town where hygienic rules are least observed. As the annual deaths exceed the births, the population is maintained by immigration.

M. Greenwood.

SOREL (F.). L'oeuvre sanitaire de la Circonscription de Dakar et dépendances pour la protection de la santé publique (1927–1928). [**Sanitation at Dakar.**]—*Bull. Soc. Path. Exot.* 1929. May 8. Vol. 22. No. 5. pp. 368–377.

In recent years the French port of Dakar has been visited by serious outbreaks of plague and of yellow fever. The purpose of Sorel's paper

seems to be to show that there was much indeed in Dakar that was highly insanitary, but that works of sanitation had been begun before the plague and yellow fever of 1927–28 and that these works (and all they implied) played a part in bringing about the epidemics.

Early in 1927, he says, the simultaneous carrying out of great public works of several kinds (*travaux d'agrandissement, d'amélioration et d'assainissement*) had turned Dakar into one huge "works," and he recalls the opportunities for increase of stegomyia under such circumstances. In addition he admits that Dakar, free from yellow fever for 15 years, had deceived itself into thinking the disease had disappeared for ever, and he hints that CARTER's views on the spontaneous disappearance of yellow fever fostered this unfortunate belief.

A long account follows of the actual improvements in fundamental sanitary arrangements which have been carried out. [Disease outbreaks when large works are in progress in the tropics have been so common that they ought to be anticipated. Sorel repeats the well-worn story about the increased breeding-places for mosquitoes which the works provide, but he makes no mention of the factors of over crowding, population movements, aggregation of susceptibles, and the like, which were emphasized by CHRISTOPHERS as long ago as 1908 (*Sc. Mem. by Med. Officers of Govt. of India*, New Ser., No. 35, p. 2) and upon which modern epidemiology lays equal stress.]

J. F. C. H.

DUBOCCAGE. La natalité chez les Bakongo dans ses rapports avec la gynécologie. [**The Relation of the Birth-Rate in the Bakongo Tribe to Diseases of Women.**]—*Ann. Soc. Belge de Méd. Trop.* 1929. Oct. 30. Vol. 9. No. 3. pp. 265–274.

The author has recently spent twelve months at Kisantu in Bas-Congo and has studied those diseases of women in relation to childbirth which touch the grave problem of native depopulation. He had 150 hospitalized women under his care and has the impression that their gynaecological affections are as varied as in Europe. He describes the conditions seen with illustrative cases.

A. G. B.

SEIDELIN (Harald). Le travail médical des huileries du Congo belge pendant cinq ans. [**Medical Work of the Oil Companies of Belgian Congo.**]—*Ann. Soc. Belge de Méd. Trop.* 1929. Dec. 31. Vol. 9. No. 4. pp. 285–305. With 26 figs. on 15 plates. [1 ref.]

The author published an earlier note on medical affairs in the Congo (*Bulletin of Hygiene*, 1927, Vol. 2, p. 75). Here he discusses in general terms the problems of medical assistance in that area. He concludes that the complete confidence of the natives has not yet been won by western medicine. Numerous excellent illustrations are given and many statistical tables.

[The latter are often of very little value from the omission of important data which it would seem quite possible to give. For example, in sickness data of employees the numbers of dispensary cases, hospital cases and deaths are given for many places, but the number of the employees contributing these cases is often omitted. One hears persons whose experience is mainly tropical casting doubt on the usefulness of including elementary statistical training in courses of

instruction for those going to the tropics, on the ground of the impossibility of securing reliable data in the tropics. Such instruction, if it did no more, might prevent the publication of tables which seem to promise valuable information, but are in fact almost useless.]

J. F. C. H.

McNabb (J.). **Disease Incidence and Diet of Natives at Lake Magadi.**—*Kenya & East African Med. Jl.* 1929. Nov. Vol. 6. No. 8. pp. 212–221.

This paper refers to the adult male natives who are employed at the Soda Works and remain on an average 6 months; their numbers varied in 1927 to 1929 between 725 and 844. They are medically inspected before arrival. The climate is hot and dry and there is no natural source of fresh water; this rules out ankylostomiasis. Though two species of Anopheles are found (*costalis* and *funestus*) and breed in water containing up to 2½ per cent. of soda, malaria is conveyed to only a slight extent; children have no enlarged spleens; so that malaria is practically non-existent. Employees unfit for work have to see the doctor. At present about one-sixth of them are housed in concrete buildings. The health of the settlement has steadily improved. For 1927–29 the death rate has been 5·7 per mille (enteric 4 deaths, malaria 2). A summary of cases treated in the hospital is given; it is remarked that diseases commonly associated with debility and undernourishment, such as pneumonia, tuberculosis and ulcer, are not prominent. The ration provided is :—

" 2-lbs. maize meal daily.
2-lbs. meat and bone, weekly, in two portions.
2-lbs. beans and peas, weekly, in two portions.
Salt *ad lib.*"

This diet, the author remarks, is deficient as regards fresh vegetables and to a less extent fresh meat. Few supplement the diet at the shops and the green stuff obtainable outside is almost negligible. In fact, the natives seem to do not badly on it. In six months there was an average weight increase in one batch of 8·9 lbs. It is concluded that the diet is nearly adequate; the qualification is added because in 1928 6 cases of night blindness were treated and there have been cases of myositis and synovitis (9 and 20 in 1929) which have suggested deficiency; notes of one such are given.

A. G. B.

Ganora (Romualdo). Note sulle condizioni climatiche e patologiche della Dancalia e della Migiurtinia. [**The Climate and the Diseases of Dancalia and Migiurtinia.**]—*Arch. Ital. Sci. Med. Colon.* 1929. Nov. 1. Vol. 10. No. 11. pp. 513–519. English summary p. 519.

The author was three years in these districts on the Coast of the Red Sea and the Gulf of Aden and he describes briefly the climatic conditions. The diseases met with occurred in the following proportions: Tropical ulcers 40 per cent., syphilis and venereal affections 21, gastro-intestinal and rheumatic 17, malaria 13, and ocular diseases 9 per cent. No other figures are given, but a few remarks are made on each.

Secondary and tertiary syphilis are frequent and cause much mutilation; tropical ulcers are associated with spirochaetes and fusiform bacilli (apart,

that is, from syphilitic ulcers); intestinal parasites, except perhaps Ascaris, are few, and gastro-intestinal disturbances are largely dietetic in origin. Malaria is generally subtertian and at the onset is often associated with vomiting and the passage of mucosanguineous stools, leading to a suspicion of amoebic dysentery; emetine, however, is ineffectual, whereas quinine acts like a charm. Ocular conditions are chiefly catarrhal conjunctivitis and trachoma. Other tropical diseases such as relapsing fever, undulant fever, dengue, climatic bubo, beriberi, and Madura foot are occasionally seen.

H. Harold Scott.

CORREIA (Alberto Carlos Germano da Silva). Le climat et la nosographie de l'Inde Portugaise. [**Climate and Diseases of Portuguese India.**]—*Arquivos da Escola Méd.-Cirurg. de Nova Goa.* 1929. Ser. A. No. 4. pp. 461–512. With 7 plates.

Portuguese India consists of three districts on the west coast of that peninsula of a total area of 1,638 sq. miles; of this Goa, with a population of 469,000 persons, has 1,469 sq. miles. The other districts, Damão and Diu, north of Bombay, are obviously of less importance. The littoral portion of Goa is flat, the inner hilly, rising to 700–1,100 metres above sea level. The author gives a detailed description of the territory, its geology, vegetation, seasons and meteorological conditions. He notes that April and May, coming between the monsoons, are characterized by extreme heat and low humidity. In Goa the littoral may be regarded as healthy, the hilly interior as unhealthy. He passes in review the chief diseases met with:—

Malaria is widespread and most severe on the foothills of the Western Ghats. It is at its worst as a rule after the rains, in September to November. Thirteen species of Anopheles are named. No case of blackwater has been recorded. The old capital of Goa, which boasted a quarter million inhabitants, is now deserted and uninhabitable owing to malaria. Details of the splenic index in many parts of Goa and the other districts are given and a table of malaria deaths from 1916–1927; the total, about 2,000, has not varied much from year to year.

A similar table for *tuberculosis* records about 500 deaths a year.

Enteric fevers are endemic, especially amongst the Hindus. The disease is most prevalent in September–November, but most fatal in April and May. Soil pollution is general. Deaths number 300–400 annually.

Venereal diseases are widespread, but no statistics are available.

Leprosy.—157 lepers are known [196 appears to be an error], 111 men and 46 women. It is said that the disease is freely introduced from British India and from Africa.

Smallpox.—The years since 1825 in which serious epidemics have occurred are listed. The disease is at its worst in the months March–June. This is the dry period and experience in Goa is in accord with ROGERS' observations in British India [see *Bulletin of Hygiene*, Vol. 2, p. 419]. The author is unable to trace with GRAHAM a 5-yearly periodicity.

Beriberi is only sporadic in Goa.

Cerebrospinal meningitis was shown to exist in Goa in 1927. It is at its maximum in September and October when the relative humidity is high, and at its minimum in the hottest and driest months, April, May and the first half of June.

Cholera is not endemic in Portuguese India, but is frequently introduced from Bombay. The first epidemic, in 1543, was described by Gaspar CORREIA. A long list of subsequent outbreaks is given. Big epidemics have almost always coincided with years of excessive rain, of which many instances are given.

Plague is not endemic in Portuguese India. There is record of it in 1635 in the old capital, and it reappeared in 1896. The epidemics which have recurred almost yearly since are described. In 1924 and 1927 it occurred in epizootic form.

A. G. B.

VAN DRIEL (B. M.). Eenige beschouwingen naar aanleiding van de sterftecijfers der contractarbeiders ter Oostkust van Sumatra over 1925 en 1926. [**Statistics of Mortality of Indentured Labourers in Sumatra.**]—*Meded. Path. Lab. t. Medan-Sumatra.* 1928. No. 4. 69 pp. With 6 graphs. [47 refs.] [Summary appears also in *Bulletin of Hygiene.*]

In the introduction, the desirability of obtaining reliable mortality and morbidity statistics is stressed and a compliment is paid to the United Fruit Company which, it seems, is able to prepare an annual report on the health of its labourers comparable with military or naval reports. The first part of the report deals with causes of death in hospitals in 1925 and 1926; pneumonia and tuberculosis were responsible for 231 and 151 deaths in 1925, for 281 and 209 in 1926; in these years there were 17 and 20 deaths from cancer. There are many charts. The rates of (hospital) mortality in terms of the numbers of contract labourers are shown. In the next section, suggestions for the improvement of the statistics are discussed. In the last section results are compared with the rates or mortality observed in other tropical countries. The general conclusion is drawn that the conditions are increasingly favourable, that the labourers suffer a lower rate of mortality than the populations from which they are recruited.

M. Greenwood.

GOELAM. **An Investigation into the Health Conditions of the Island Enggano, Res. Benkoelen, (25-30 June 1928).**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1929. Vol. 18. No. 1. pp. 153–163. With 5 figs. on 3 plates & 1 map. [5 refs.]

Goelam tells of his six days' visit to this island [off south-western Sumatra]. Early records (such as they are) indicate a steady diminution of the population, and recent, more reliable, figures confirm this. Earlier investigators have attributed the depopulation to close intermarriage, practice of abortion, syphilis and other factors. The present author says that nowadays miscarriage is rare and wilful abortion never practised, but that there is among the women "childlessness in a considerable degree." The part played by venereal diseases in causing this relative sterility remains uncertain. Malaria is chronically endemic with high parasite index and moderate spleen index. Further enquiry is desirable and education in health matters must underlie any attempted improvement.

J. F. C. H.

Goco (E.). **Common Diseases among Infants and Children in the Puericulture Centers of Manila.**—*Jl. Philippine Islands Med. Assoc.* 1929. Nov. Vol. 9. No. 11. pp. 385–396.

The data utilized are based upon the records of five puericulture centres established in the City of Manila from 1923 to 1928. A table gives the figures for each centre in each year; it is seen that 88,000 children were registered (37 per cent. under one year, 51 per cent. between 2 and 16 years), and 54,000 were accounted sick; only 2,000 died. Of the 88,000, 28·5 per cent. were 7 per cent. undernourished; 19 per cent. were 10 per cent. undernourished; and 10 per cent. were 15 per cent. undernourished, leaving 42 per cent. as normal [but the number of cases of "malnutrition" was considered too small to be worth a place in the table below?] The table shows the frequency of the diseases found.

Disease.	Total cases.	Percentage.
Respiratory diseases	8,667	15·9
Skin diseases	5,661	10·2
Conjunctivitis and trachoma	3,468	6·4
Intestinal parasites	3,285	6·0
Nasopharyngeal obstruction, adenoids, tonsil and sinus enlargement	3,240	5·9
Infantile beriberi	2,739	5·0
Whooping cough	593	1·0
Gastro-enteritis	581	1·0
Measles	497	0·9
Malaria	468	0·8
Dysentery	336	0·6
Otitis media	248	0·4
Multiple abscess	175	0·3
Nephritis	227	0·4
Tuberculosis, general form	159	0·2
Stomatitis, simple and aphthous ...	136	0·2
Parotiditis epidemica	123	0·2
Others	23,496	43·4

[The number of "others" detracts much from the value of the figures.] Diseases represented by "only a few cases" were: syphilis, yaws, tropical ulcer, rickets and scurvy, umbilical tetanus.

A. G. B.

Crichlow (N.). **The Prevalent Diseases of the British Solomon Islands.** —*Trans. Roy. Soc. Trop. Med. & Hyg.* 1929. Aug. 26. Vol. 23. No. 2. pp. 179–184. [1 ref.]

The author is Travelling Medical Officer of the British Solomon Islands Protectorate, with a population of some 150,000. He gives a general account of the diseases met with. *Malaria* is widespread. The spleen-rate under twelve is given as 80, and over twelve as 40, the parasite rate in children as 80 (benign tertian 70, subtertian 20, mixed 10). [The number of observations is not given, nor is it stated

whether these figures apply to one or several islands of the group.] SAYERS, of New Georgia, has found quartan parasites in native children [this *Bulletin*, Vol. 26, p. 369]. In 1928, 187 cases of malaria were treated at the Government Hospital, Tulagi. *Blackwater* was rare before 1915; 6 out of 18 deaths of Europeans in 1926 and 1927 had this cause. A case of a "blackwater fever house" is briefly cited. "All the usual" *pulmonary diseases* are met with. Among indentured labourers they are responsible for 20 per cent. of the deaths; pneumonia is not specifically mentioned. *Tuberculosis*, pulmonary, glandular and arthritic, is prevalent. *Dysentery* is responsible for a heavy death-rate; the prevailing type is bacillary; no widespread epidemic since 1915. *Yaws* is the commonest disease. On Malaita the incidence is 60 per cent. Salt water natives show a higher incidence than bush natives. Yaws is responsible for a high infant mortality. *Filariasis* is fairly common, elephantiasis rare. A survey showed 15 per cent. to harbour filarial embryos in the blood [? *bancrofti*]. The usual *intestinal parasites* are widely prevalent. The extent of *leprosy* is unknown: *Gonorrhoea* and *granuloma venereum* occur, but syphilis has not been diagnosed. *Tropical myositis* is present and is usually assigned, without proof, to a filarial origin. [BUXTON doubts whether filaria has any relation to myositis (this *Bulletin*, Vol. 26, p. 437).] The most common *skin diseases* are tinea imbricata and scabies. *Measles*, apparently introduced in 1914, was epidemic in 1927 and 1928, but rarely causes death. *Anterior poliomyelitis* was epidemic in 1925 and was very fatal to indentured labourers. *Beriberi* has practically disappeared. *Ascites* with great enlargement of spleen accurs and is attributed to yaws. Diseases not known to exist are smallpox, scarlet fever, cholera, plague and possibly diphtheria and typhoid.

[The value of this paper would have been enhanced by the inclusion of actual numbers of cases, without which percentages may easily mislead.]

A. G. B.

BARBIER. L'assistance médicale aux îles Wallis et Futuna. [**Medical Assistance in the Wallis and Futuna Islands.**]—*Ann. de Méd. et de Pharm. Colon.* 1929. July–Aug.–Sept. Vol. 27. No. 3. pp. 441–453. [1 ref.]

[The Wallis Archipelago, a dependency of New Caledonia, lies to the north-east of Fiji and west of the Samoa group (at 176–178° E.), has an area of 40 square miles and a population of 4,500. Futuna (not the Futuna of the New Hebrides), with 1,500 inhabitants, lies south of the Wallis Islands.]

These islands had a resident doctor between 1905 and 1909, Dr. VIALA, who put his observations on record in a very interesting paper (1909). There followed an interregnum of 15 years when, in 1924, the author was appointed. He reports that two diseases dominate the pathology of these islands—filariasis and syphilis with yaws. As to filariasis, he believes that in Wallis all the natives and almost all the 15 Europeans are infested; at Futuna the incidence is less. One case of chyluria was seen, but none of lymph scrotum or chylous hydrocele. The ordinary form of hydrocele is common. Almost the only manifestation is elephantiasis, attacking usually the lower limbs,

then in order of frequency the scrotum, and lastly the arms and in females the breast. Collections of pus, sometimes seen, always contained streptococcus.

Syphilis and yaws. The author has treated 280 cases of syphilis, i.e., about 5 per cent. of the population. Chancre was not seen and secondaries but rarely. Among tertiary symptoms a form extremely widespread is a symmetrical keratodermia of the palms and soles, accompanied by a slowly progressing pseudovitiligo. Very few natives escape yaws. The children infect themselves at the end of the first year by reason of the universality of itch ; they crawl about, and infect their lesions from other members of the family. In 19 months he treated 750 yaws cases, nearly all in children.

Malaria is non-existent in these isles ; Anopheles seem to be absent. [BUXTON points out that south and east of the New Hebrides (about 170° E.) anopheles and malaria are absent.]

Leprosy is present in 2·2 per cent. of the inhabitants of Wallis a least, for these were all bacteriologically positive. No case has been seen in Futuna. However, a large number of people have claw-hand (main en griffe) suggestive of leprosy. There is no other sign. The cubital gland is normal to palpation ; anaesthetic areas and maculae are absent ; atrophy of the thenar and hypothenar eminences is nil or scarcely marked except in very old cases. All the movements of the thumb are generally preserved, the contraction affecting the digits. People have been seen who have had this deformity unchanged for 30 years. The author asks, Is this leprosy ? If so, its virulence is much attentuated.

Tuberculosis. Cases are numerous, but the disease is less frequent than in other parts of Polynesia ; 58 cases of open pulmonary tuberculosis were seen. In many instances its progress is slow and the patients do not die till relatively old. About 3 per mille have tuberculosis in some form.

Epidemics have occurred of chickenpox, whooping cough and mild influenza. Smallpox has not been seen for 40 years ; the author has induced the natives to submit to vaccination. Of 308 examined for intestinal ova, 15 were found with ankylostomiasis ; none had marked anaemia.

Of skin diseases, itch and pediculosis are widespread. Tokelau, common enough 20 years ago, has almost disappeared : 7 cases were seen, all at Futuna.

[Beyond stating that 8 night-bloods out of 10 contained microfilaria the author gives no figures for filarial incidence and no precise information about mosquitoes. He does not discuss the possibility that the only tertiary manifestation he describes is one of yaws rather than syphilis. He gives no indication whether the population of these South Sea islands shares in the decrease so generally described.

VIALA'S paper (*Ann. d' Hyg. et de Méd. Colon*, 1909, Vol. 12, pp. 189 and 422) is worth consulting by those interested. Viala combined the offices of administrator and medical officer. He noted the great frequency of elephantiasis and stated that he saw no other manifestation of filariasis—indeed, he doubted whether the two conditions are related at all. The second place in the nosology he gave to phagedaena, a frequent complication of the numerous wounds and ulcers. He also found claw-hand extremely common—on Wallis up to 50 per cent. had it—and discussed its relation to leprosy.]

A. G. B.

GODAL (J.). Notes médicales recueillies au cours d'une croisière de deux ans dans le Pacifique. (Décembre 1926–Novembre 1928.) [**Medical Notes made on a Two Years' Cruise in the Pacific.**]—*Arch. Méd. et Pharm. Nav.* 1929. Oct.–Nov.–Dec. Vol. 119. No. 4. pp. 589–602. [3 refs.]

The author visited the French possessions in the Pacific and a number of those of other nations—British, Dutch, American; his notes are somewhat sketchy. New Caledonia, without malaria, is compared with the New Hebrides and scattered French groups in the Pacific. The conclusion is that the French doctors are insufficient to contend with the syphilis, tuberculosis and dysentery that are found and especially leprosy, the advance of which is serious. In the Anglo-Saxon islands there are doctors, hospitals and laboratories in all the chief centres. The hospitals are better and more comfortable than those of the French. The hygiene of Noumea, the "point noir" of the French possessions, in the South Seas, is described as "déplorable."

A. G. B.

COMMONWEALTH OF AUSTRALIA. Department of Health. **Epidemiological Record of the Austral-Pacific Zone for the Year 1928.**—36 pp With 1 folding map. Canberra.

This Epidemiological Record is based chiefly on current reports forwarded during 1928 by the health administrations within the "Zone"; 21 such administrations are listed with the respective populations. The diseases are discussed alphabetically from cerebrospinal meningitis to yellow fever, the latter entry showing that the author does not restrict himself to diseases occurring within the zone. Some points of special interest to our readers are mentioned here.

A few cases of dengue were recorded this year at Brisbane and Thursday Island. The last epidemic in Queensland occurred in January–April, 1926, and it is noted that the secular periodicity here approximates to a five or six-year cycle. Under filariasis it is noted that in Australia there has been a steady decline in the number of cases admitted to hospital showing clinical manifestations—abscesses, lymphatic affections, etc.; the reason is obscure. Leprosy distribution throughout the zone is given in some detail, especially in Nauru Island where 132 lepers were in segregation during the year. Of malaria the findings of a survey in 1927 are quoted to the effect that in North Queensland the prevalence has declined very much and the disease is possibly disappearing. Only one case was notified from this area in 1928; and of 18 other Australian cases only 6 were indigenous—from the north-west of Western Australia. There has been no human plague in the zone since an isolated case at Sydney in 1923. The skin diseases in the tropical parts of the zone are chiefly tinea imbricata, scabies and tropical ulcer. Sprue was not reported during the year. With regard to tuberculosis it is the opinion of Dr. LAMBERT as well as that of some of the older medical officers that there is no undue amount of pulmonary tuberculosis in most Pacific groups. Both pulmonary tuberculosis and typhoid fever are declining in Australia and New Zealand.

A. G. B.

HOOTON (A.). **Medical Relief in Villages.**—*Indian Med. Gaz.* 1928. May. Vol. 63. No. 5. pp. 265–269.

The information given here is almost identical with that given by the same author in a paper noticed in this *Bulletin*, 1928, Vol. 25, p. 367.

BERTRAND (Jean). Pourquoi vieillissons-nous plus vite dans les pays chauds?—*Bruxelles-Méd.* 1929. Dec. 1 & 8. Vol. 10. Nos. 5 & 6. pp. cxlix-cli, cliv-clv; clxxxix-cxci, cxciii-cxcv.

BLAGOWESCHENSKY (D. I.). Das Pariser Grün als Larvizid bei der Bekämpfung der Malariamücken.—*Rev. Microbiol. et Epidémiol.* 1928. Vol. 7. No. 2. German summary pp. 226–227. [In Russian pp. 156–168. With 8 figs. & 1 chart in text. 62 refs.]

FERNANDEZ (Francisco M.). The Present Status of the Practice of Medicine and Sanitation in Cuba.—*Southern Med. Jl.* 1930. Jan. Vol. 23. No. 1. pp. 6–8.

GASPERINI (Carlo Gasperini). Le ragioni igieniche ed economiche della nuova legislazione sulle acque nell' Isola di Rodi.—*Riv. di Malariologia.* 1929. Nov.–Dec. Vol. 8. No. 6. pp. 702–712. [English summary (5 lines) p. 748.]

JOLLY (G. G.). A Simple Rat-Trap used by the Shan Villagers of the Northern Shan States, Burma.—*Indian Med. Gaz.* 1928. June. Vol. 63. No. 6. pp. 303–304. With 2 text figs.

KOROSTELEW (W. E.). Encore sur l'effet larvicide du vert de Paris.—*Russian Jl. Trop. Med.* 1929. Vol. 7. No. 4. pp. 299–303. [In Russian. French summary p. 303.]

LEGER (Marcel). L'anémie tropicale idiopathique et son hématogramme.—*Arch. Mal. Coeur, Sang, Vaisseaux.* 1928. No. 7. 8 pp. [Summarized in *Bull. Inst. Pasteur.* 1929. Dec. 15. Vol. 27. No. 23. p. 1070.]

DE SÁ (L. J. Brás). Contribuição ao estudo do saneamento e assistência nas Novas Conquistas.—Oitavo Congresso Provincial da India Portuguesa. pp. 79–123. [31 refs.]

SELLA (Massimo). Gambusie e verde di Parigi nella lotta antimalarica a Rovigno (relazione per il 1928) e cenni sulla lotta in Istria.—*Riv. di Malariologia.* 1929. July–Aug. Vol. 8. No. 4. pp. 357–392. With 4 text figs. (1 map). [1 page of refs.] [English summary p. 478.]

STUART (E.) & STOVER (N. M.). Eradication of Salt Marsh Mosquitoes.—*Amer. Jl. Public Health.* 1927. Vol. 17. pp. 704–707.

SUAREZ (Ramon M.). "La histamina y la secrecion gastrica en algunas enfermedades tropicales."—*Bol. Asoc. Med. de Puerto Rico.* 1930. Jan. & Feb. Vol. 22. No. 175. pp. 41–45. With 1 chart. [12 refs.]

SUR (S. N.) & SARKAR (Haripada). Paris Green as an Anopheline Larvicide.—*Indian Med. Gaz.* 1929. July. Vol. 64. No. 7. pp. 376–378. [4 refs.]

SUR (S. N.) & SARKAR (Haripada). Epidemic Jaundice (Weil's Disease) or Malaria in Kandi Subdivision of Murshidabad District in 1928.—*Indian Med. Gaz.* 1929. Nov. Vol. 64. No. 11. pp. 619–620.

TRIBOUILLET (P. H.). L'assistance médicale en Indochine. Une grande oeuvre française.—*Presse Méd.* 1930. Jan. 8. Vol. 38. No. 3. pp. 43–44. With 2 text figs.

WANLESS (William J.). Medicine in India.—*Bull. New York Acad. Med.* 1930. Feb. Vol. 6. No. 2. pp. 105–131.

WERBER (E. I.). Zwalczanie widliszków w okolicach Warszawy oraz spostrzeżenia biologiczne nad anofelizmêm. (Beiträge zur Naturgeschichte des Anophelismus und seine Bekämpfung mit Schweinfurtergrün.)—*Medycyna Doświadczalna i Społeczna.* Warsaw. 1928. Vol. 9. No. 3/4. pp. 237–254. With 2 text figs. [10 refs.] [German summary pp. 255–257.]

REVIEWS AND NOTICES.

KLIGLER (Israel J.) [Director, Department of Hygiene, Hebrew University, Jerusalem, formerly Director of the Malaria Research Unit, Department of Health, Palestine]. **The Epidemiology and Control of Malaria in Palestine.**—pp. xv+240. With 22 maps, 19 charts & 32 text figs. The University of Chicago Press, Chicago, Illinois. [22s. 6d.]

The study of malaria in Palestine opens up a variety of attractive lines of investigation. The climate shows great differences in temperature, rainfall and other factors between different seasons, and it is also erratic from year to year. Though the country is so small, it is extremely varied in its surface features, and it includes the bottom of the Jordan Valley, which is much more below sea level than any other area in the globe. There are rivers and swamps, springs and salt marshes; and there are barren, waterless, limestone uplands, and great downs of loess. There are people of almost every creed and every degree of civilization. There is, moreover, a more than sufficient amount of malaria, and some eight species of *Anopheles*. It may well be that in the future Palestine will come to be recognized as one of the best places for the teaching of malariology in nearly all its aspects.

Dr. Israel Kligler, the author of the book before us, has lived about eight years in Palestine, directing a Malaria Research Unit which devoted its energies in the first place to the study and control of the disease in the Jewish Agricultural Colonies, so many of which are placed, for lack of more suitable sites, in particularly unhealthy parts of the country. He and his collaborators have occupied themselves in collecting, tabulating and digesting a great range of relevant facts collected from the populations of these colonies. In the present book he has made use of this information, and also of everything that was available relating to the Gentile population. His book is a full and careful study, containing large numbers of tables and a number of good line drawings and charts; the half-tones are much less successful. If I criticize the book, it is because, as a whole, it is valuable and because the problem under consideration is profoundly stimulating. I feel that Dr. Kligler has put hardly sufficient stress on the terrible urban malaria which prevailed until ten years ago. It will be remembered that in Palestine *Anopheles bifurcatus* breeds in subterranean water, particularly in cisterns, which are innumerable in the villages and towns, beneath the very houses themselves. This insect, living so closely associated with man, produced very grave malaria in nearly all the upland towns and villages, until its control was undertaken by the Department of Health. In Palestine, perhaps more than anywhere else in the world, the strongest contrast exists between urban malaria, due to this one vector, and rural malaria, due to several species of *Anopheles*, and not differing greatly from the familiar malaria of many other countries. Then, again, one would like fuller and more precise figures with regard to the differences which have been observed year by year in the rainfall, the extent of the swamps, and the incidence of malaria in the neighbouring villages and settlements. It is a matter of general belief that a close relation exists between the amount of the annual rainfall and the epidemiology of the disease, but the point requires complete study and elucidation. The account of the population of Palestine is perhaps the least successful part of the book. It is a matter of surprise to see a distinction drawn between the "Arab" and "Bedouin." To anyone familiar with these races, the word Arab connotes first, foremost and above all things the nomadic camel owner, and that is the distinctive sense in which the word is used in the Arabic language.

Dr. Kligler's account of malaria in Palestine will be found of interest and value in all tropical countries. Practically all the sides of the subject

are dealt with, and a mass of facts is tabulated. The ordinary reader may perhaps not find it easy to discover what he wants, and may fail to realize the particular interest of Palestine to students of malaria.

P. A. Buxton.

KÄYSER (J. D.) [Lector voor Tropische Huidziekten aan het Instituut voor Tropische Ziekten, Rotterdam—Leiden]. **Voordrachten over Tropische Huidziekten. Met een hoofdstuk over Myiasis veroorzakende vliegen door Dr. P. H. van Thiel.** [Lectures on Diseases of the Skin in the Tropics.] 2de Verbeterde en vermeerderde druk.—pp. ix+494. With 66 plates & 24 figs. 1929. Weltevreden: G. Kolff & Co.

The author has been for many years lecturer on diseases of the skin at the Leiden School of Tropical Diseases and his interesting lectures are well known to all students who attended courses of instruction at that institution. The book contains a selection of his lectures and deals mainly with diseases of the skin met with in the Dutch East Indies. As such it should be of great value to medical men in the Malay Archipelago and to students of the tropical schools in Holland.

Its practical value is increased by a detailed and up-to-date discussion of the treatment of gonorrhoea in both sexes.

In an interesting chapter van THIEL gives a classification and description of flies causing myiasis.

A great number of good photographs is included in the book.

H. Lwow.

D'HERELLE (F.) [Professor of Bacteriology, Yale University School of Medicine]. **The Bacteriophage and its Clinical Applications.** Translated by George H. SMITH [Professor of Immunology, Yale University School of Medicine].—pp. viii+254. With 10 charts. 1930. London: Baillière, Tindall & Cox, 7 and 8, Henrietta Street, Covent Garden, W.C. 2. [18s.] [Review appears also in *Bulletin of Hygiene.*]

All who have followed medical literature in recent years know of d'Herelle's work, and those whose sphere of study has been particularly affected by his researches are familiar with his views. These are here set out in the conveniently compact form of a reprinting of the 1928 Lane Lectures at Stanford University.

J. F. C. H.